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RESUSCITATION FROM ELECTRIC SHOCK

The National Electric Light Association deserves the gratitude of the electrical industry for initiating the investigation into the best method for resuscitation from electric shock, represented by the rules published elsewhere in this issue. The *Electrical World,* we believe, was the first to publish a thorough and systematic set of electric resuscitation rules. This was in 1895, and a revised edition was printed by the same paper in 1902. Several years ago it took up the matter of another revision, and through the National Electric Light Association, the co-operation was secured of the American Medical Association and the American Institute of Electrical Engineers, all of which had representatives on the committee which prepared the present code. As stated in the article elsewhere in this issue, however, the work of the commission is not represented by this short code only. It has prepared similar rules, more in detail, which are to be issued by the National Electric Light Association. Another committee, consisting of the medical members of the main committee, has also undertaken the study of the mechanical means which have been proposed for inducing respiration. According to the *Electrical World,* one member of the committee, Dr. Meltzer, of the Rockefeller Institute for Medical Research, has devised a new method that has, in trials on animals, proved a great advance over those previously known, and there is no reason to believe that in application to the human subject it will be found less superior. A further subject of research by the medical members will be a means for restoring the beat of the heart after that organ, through shock or otherwise, has been thrown into a fibrillating condition. This problem of reorganizing the energy of the heart, which may persist for some moments after being thrown out of normal action, has heretofore defied medical science.

CO-OPERATIVE COMMITTEE IN PHILADELPHIA

The co-operative plan of adjustment of relations with employees is now an active force in the operation of the Philadelphia Rapid Transit Company. It has been incorporated in the working policy of the company for the present as a means of settlement between the men and the management without regard to the divided affiliations of the employees with labor organizations. In other words, it brings the men, as individuals, through their committee into direct touch with the management. This places the plan on a good basis for co-operative effort. The promise of the company to devote 22 per cent of gross earnings to wages and benefits for trainmen really puts upon the committee the responsibility not only of taking up points of dispute for adjustment but also of making suggestions for the improvement of the service. A reading of the bulletins which the company is now wisely sending to each trainman and which were reviewed in these columns last week shows the wide scope of the problems considered at the meetings between the committee and the management and the spirit in which they are settled. It is evident from these bulletins that many of the complaints are based on

conditions of long standing. Some appear trivial, but others are considered by the men to be causes of dissatisfaction and for that reason are deemed worthy of attention by the company. Among such matters are the provision of better quarters for the men and physical improvements in the system which not only relieve the trainmen of some burdens but also aid the service. The labor situation had been unsettled for so long a time when the new management took hold in Philadelphia that it was apparent that such hope for improvement as existed would lie in the adoption of new methods. It is, of course, too soon to express fair judgment upon the prospects which the present plan offers for ultimate success, but certainly observation in this case shows that the arrangement is commendable for its removal so quickly of a number of causes of difference between the management and the men. If employees learn to feel that their interests prosper with those of the company, a substantial forward step is taken.

PITTING OF BOILER SHELLS

The pitting of steel or wrought iron, not only in the shells and tubes of steam boilers, but also in economizers, feed-water heaters, and in fact in any piece of apparatus containing hot water, is a phenomenon which has never been satisfactorily explained. In some cases the primary cause can be charged to acid in the water, but there are places where absolutely neutral water causes the same result. It is a fact, perhaps not widely known, that stagnant hot water seems to develop strongly corrosive qualities. This is shown in the necessity for making open feed-water heaters and economizers of cast iron, the earlier designs of steel plates or tubes having been found to pit badly. Certain types of boilers having banks of tubes and drums which contain practically stagnant hot water have also developed this trouble, and in one case at least the pitting was stopped by coupling up the offending bank of tubes with the general system of circulation. The increased rapidity of circulation apparently eliminated the pitting. A suggestion was recently made that the corrosive property which hot water appeared to develop when stagnant was really due to the liberation of the free oxygen held in solution by all raw water in some exceedingly active form similar to ozone. The reasoning is plausible. There is good cumulative evidence in the apparatus already cited to the effect that a strong circulation eliminates pitting, and apparently the only difference between water in motion and water at rest is that the former will scour the sides of the containing vessel clean while the latter will permit suspended solids or bubbles of gas to adhere to them. The explanation, of course, limits the corrosive action to water which is being heated rather than water which is actually hot. However, it seems quite probable that this limitation applies to the examples cited, because in each case a certain, if small, percentage of raw water is always going through the process of being heated up to the general temperature of the containing vessel. In fact, it is well known that most of the pitting which takes place in the front part of a locomotive boiler, containing practically stagnant water, occurs just below the checks where the comparatively cold feed receives its first application of heat by contact with the hot water inside of the boiler shell.

SCHEDULES AND SERVICE

One of the most puzzling things in electric railway service is the treatment of that class of lines which is neither strictly interurban nor of the ordinary suburban type, but something between the two. There is no difficulty in looking after the traffic of a strictly interurban road run on substantially steam railroad lines with a regular timetable and well-placed stations. It is not difficult to determine what arrangement of trains will fairly suit public convenience, considering the connections at each end of the line, and a suitable timetable can be worked out on the usual principles. On the other hand, an ordinary suburban line running perhaps a fifteen-minute service most of the day with extra cars during the rush hours is a very simple proposition. Cars run with sufficient frequency meet most requirements comfortably well, and during those times in which the public is in a hurry waits are short. This is merely the ordinary case of street car traffic, just as the former case was an excellent example of what is practically railroad working.

The trouble comes with the service on electric lines which represent neither one nor the other of these conditions. Take for example the not infrequent instances of fairly long lines running single cars every half hour through the main part of the day, and perhaps at times only every hour. The termini may be small cities, and various villages and rural communities may be served on the way. Such a system has not risen to the dignity of real interurban service. Traffic does not justify it and economic conditions forbid. It differs, however, from common electric roads in that the number of cars per day is relatively small. Passengers who miss a given car will very often trudge home and put off the trip for another day rather than wait half or three-quarters of an hour, with the result that a great many nickels and dimes are lost daily unless the schedule is a very certain one. In a good many instances lines operated in this general way are punctilious in the matter of timetable and without having a fully equipped set of stations are reasonably careful in observing a close running schedule. Other lines of similar character are anything but careful, so that the car which passes Jericho Cross Roads at 11.13 one day may scud by at 11.07 or at 11.19 on the next. If the latter, no particular harm is done save possible difficulty in making connections with a cross line further along. If the former, some passengers are apt to be caught strolling down the side street just in time to miss the car.

Now, while it is obviously impossible for a long cross-country line running half-hour service to assume all the airs and graces of a fully equipped interurban system, it is possible for it to maintain, unless blocked by causes outside the range of ordinary care to prevent, a rigorous timetable so that every person who uses the line will know very closely at what minute the next car will pass his nearest stopping place. It does not involve much trouble or expense, where stops are not very frequent, to post at the convenient shelter or even on a pole the timetable of the line for that stopping place and then to adhere closely to the timetable. In other words, a country line with infrequent service cannot afford to put up elaborate stations or

to run trains in the dignified manner of a prosperous interurban line, but it can serve its little community with just the same precision and convenience. To do this requires very little added expense, an expense more than recouped by the extra fares picked up. The only thing which it does require is an appreciation of the necessity and careful drilling of the car crews. Especially is precise service necessary when there are, as frequently happens, connecting lines.

Every little while in the technical and even the daily press one sees accounts of the beautiful through electric system between one city and another. As a rule woes innumerable beset the individual who tries innocently to follow out the program which looks so alluring in print. He finds at one stage of the journey his car neatly missing by a couple of minutes its due connection with an hourly car along the next stage. The miss is usually not from any flagrant carelessness but from the lack of appreciation that there are a few through passengers to look after. At another stage he is likely to find that a crossing car has gone through a bit ahead of time and left him in the lurch again for half an hour or more. Now, if every car line pursuing a schedule calling for service not more frequent than half an hour felt itself charged with the duty of observing an accurate timetable all these difficulties would disappear and the encouragement to the through passenger would be great enough to yield a very material return to the roads concerned. It is not a difficult matter to manage, and it is a paying proposition.

Every time we look at a map of the American street railways we grow enthusiastic about the possibilities of working up large amounts of long-distance riding, and nearly every time we try an experiment we receive a painful shock at the failure of some lines to do the simple and easy things which make for good through service. In every section of the country there ought to be at least an informal traffic association, not a solemn body reporting platitudes annually at some convention, but a busy little group hustling about to see how traffic for their mutual benefit can be built up; and when this good work starts it needs for its foundation a thorough appreciation of the practical value of well-kept and well-advertised schedules.

JOURNAL BOXES AND BRASSES

A great deal of ingenuity has been displayed in the design of journal box covers to prevent the entrance into the box of dirt and foreign matter. The result is that with modern journal boxes the problem of excluding dirt at the front end of the box has been pretty well solved. The same is not true as regards the entrance of dirt at the rear end of the box. In some cases the foreign material enters through the oil by capillary attraction. Where the dust guard at the rear of the box rides on a dry seat, undue wear and friction are apt to result, with heat which is transmitted to the journal.

Several dust guards are now made of wood with a recess aperture in which a packing ring of leather, fiber, rawhide, felt or similar material can be placed. These materials are more or less absorbent and will take up sufficient oil to keep them fairly well lubricated. Such dust guards are made in two parts held together by slender rods and springs which keep them in constant contact with the dry seat of the axle. But as the wear on journal brasses is generally greater at the rear than at the front, even the best dust guard is not a perfect protection in all cases.

Another cause for hot journals is lack of attention to the packing. The natural wear of the journal and of the bearing will impregnate the oil and waste sooner or later with a fine metallic dust which in time causes the waste next to the journal to become hard and glazed so that it does not deliver the oil to the journal properly. This condition would occur, of course, even though the journal were running in a box which was sealed hermetically, and the difficulty can be remedied only by periodical repacking. In fact, probably the majority of hot boxes are caused either by packing improperly or because the boxes are allowed to run so long without having fresh surface of the packing presented to the journal that the ordinary rubbing surface of the packing becomes glazed and in a condition which will not properly feed oil by capillary attraction.

These two causes, however, are not the only ones which contribute to hot journals. On the Interborough Rapid Transit Company an epidemic of hot journals was traced to the fact that the horizontal force exerted by the brakeshoe on the wheel shifted the journal in the brass and wore the brass too large for the journal. In many cases this pressure actually crushed the babbitt lining on one side of the brass. The difficulty was overcome by the design of a brass different from the customary M. C. B. type which had the sides extended around the journal to make a full semicircle, thus providing surface to resist the horizontal thrust of the brakeshoes.

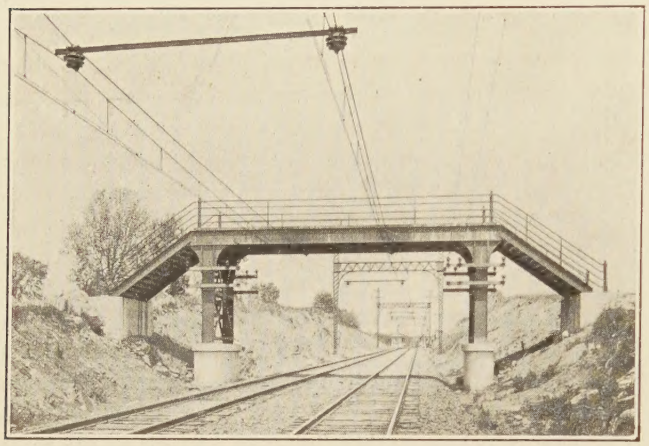
It is possible that the effect of the pressure from the brakeshoes may be responsible for a number of hot journals which are often charged to other causes. Whether or not this condition exists on any railway can be determined easily by an examination of journal brasses which have run for some period without actually getting hot. If these rock or move on the journal or show signs of crushed babbitt at one side, it is evident that they are too large and will always make trouble from heating. It may appear to be unreasonable to state that any babbitt-lined brass can wear large, but the fact that this condition has actually occurred on one road may be taken as evidence that there is a necessity for examining the fit of journal brasses.

This does not mean, of course, that brasses should be spotted on the journals or fitted with any degree of care when newly applied, but if the brasses consistently wear large from the horizontal thrust of the brakeshoes, the only apparent remedy is to make use of a semi-circular brass with more bearing at the sides of the journal, similar to that used by the Interborough company. It is, of course, true that the new type of brake rigging with two brakeshoes on each wheel eliminates the difficulty, but the scheme is hardly applicable to old cars. In fact, it is possible that the time has arrived for a change from the use of M. C. B. brasses on electrically operated cars. That type was developed mainly for use under freight cars having a braking power of 25 or 30 per cent of the weight upon the wheels, or an amount insufficient to force the journals away from the normal center line of the brass.

Track and Stations of the New York, Westchester and Boston Railway

A Description of the Permanent Way and Structures on This New Suburban Railway—All Buildings Are Designed in Accordance with a Harmonious Architectural Scheme—The Roadbed Is Most Substantial in Character

As noted in the article published in the Electric Railway Journal for May 25, the New York, Westchester & Boston Railway has been built to comply with the most arduous conditions that high-speed heavy electric traction requires. The right-of-way is remarkable for the great



New York, Westchester & Boston—Steel Footbridge on White Plains Branch

number of bridges and other special structures which were needed in order to have the track and all way buildings laid out in accordance with all future authorized grades. In short, the line was built to meet any physical conditions that are likely to arise when all the streets and highways are laid out in the territories which are served.

TRACK CONSTRUCTION

Exclusive of the Harlem River division of the New York, New Haven & Hartford Railroad, the trackage over which the New York, Westchester & Boston Railway operates consists of a four-track line from 180th Street, New York, to Columbus Avenue, Mount Vernon, and two separate two-track lines from that junction to New Rochelle and White Plains respectively. The track throughout consists of 90-lb. A. S. C. E. Bessemer rails of 18-ft. to 33-ft. length, which are spiked with 9/16-in. Goldie pointed spikes to 7-in x 8-in. x 8-ft. creosoted long-leaf yellow pine ties. About 18,000 of these ties had been on hand since 1906 and were creosoted by a local concern. The rest of the ties were new and were purchased and creosoted at Jacksonville, Fla. The total cost of the latter lot, including delivery, inspection, etc., was $1.15 each. The rails are laid on 5-in. x 8½-in. Dilworth flanged tie plates which have corrugated top surfaces and ¼-in. shoulders. These plates are installed on all ties on curves and on every other tie on tangents. The joints consist of 24-in. angle bars and are drilled to receive bonding wires behind them. The roadway is splendidly ballasted with trap rock of sizes ranging from ¾ in. to 2½ in. laid 14 in. deep at the center of the track and 7 in. at the ties.

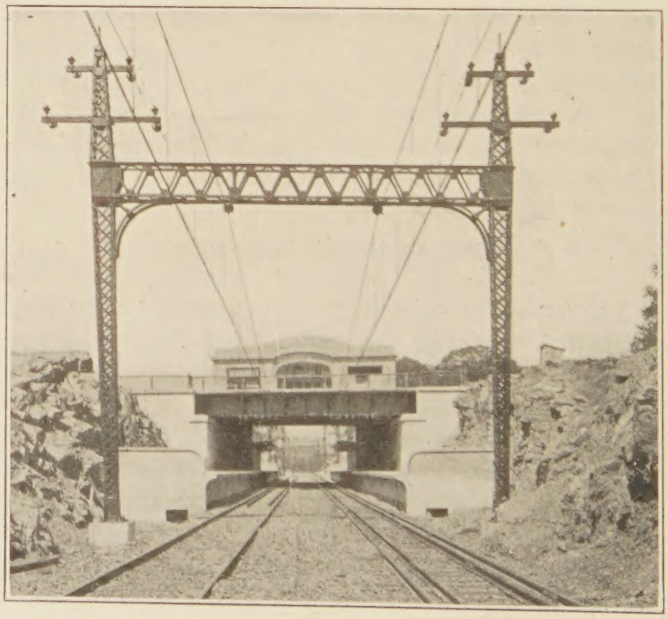
The switch ties are of plain white oak. Flat tie plates are used under all frogs, switches and turnouts. These special plates are ½ in. thick, 6 in. wide and are made in lengths up to 25 in. They have plain flat surfaces punched to suit their positions. All stiff frogs have manganese centers of the Ramapo No. 1 type. The switch points are of Bessemer rails with reinforcing bars on both sides. Guard rails are placed 10 in. from the running rail at all bridges, stations, viaducts and also in the Morris Park subway and are provided with cast-iron noses. Vaughn anti-creepers are also installed at every fifth tie to anchor the running rails at the foot of all grades and in the vicinity of all interlocking points.

The two outside tracks are used for the local service and the two middle tracks for the express service. The elevations of the outer rail on all curves have been fixed accordingly. The maximum elevation on the express tracks is for a speed of 57 m.p.h., while the maximum on the local tracks is for 35 m.p.h. All curves of 30 min. and more are provided with easement spirals at each end. The maximum curvé is 6 deg. and the maximum elevation 7 in. The track spacing on curves and tangents is ordinarily 13 ft. center to center, except on some of the old bridges where the distance is 12 ft. 6 in. A spacing of 15 ft. is used at locations where there are columns between the tracks. The following are the clearances between the street surface and overhead structures at highway crossings: 14 ft. in Mount Vernon, New Rochelle and county crossings and 16 ft. in New York City. The minimum clearance above the top of the rail is 18 ft. for overhead bridges.

Further information regarding the track construction, including the system of drainage to city sewers, is shown in the accompanying cross-sections of the two-track and four-track structures, bridges, viaducts and subway.

SPECIAL WAY STRUCTURES

The total number of special way structures is seventy, divided as follows: One four-track subway, two four-track viaducts, one two-track viaduct, forty-three railway bridges and twenty-three highway crossings. There are also four concrete arches, one of which is reinforced in part. The subway runs north for 3940 ft. from the Morris Park sta-



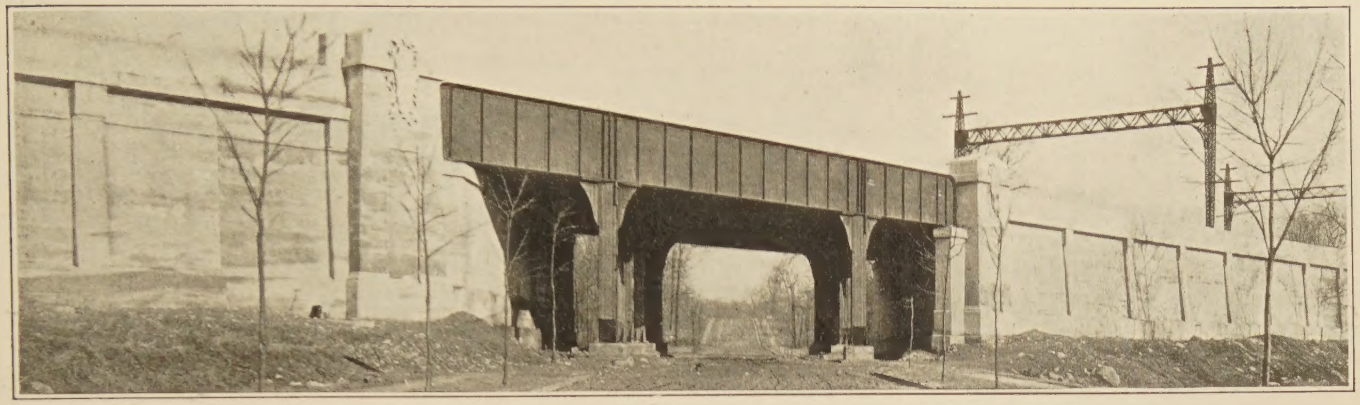
New York, Westchester & Boston—Typical Station Located in Deep Cut

tion, extending from Paulding Avenue to Mace Avenue. The construction of this underground section was required by franchise and right-of-way conditions. The owners of the property in this section have arranged to build a street

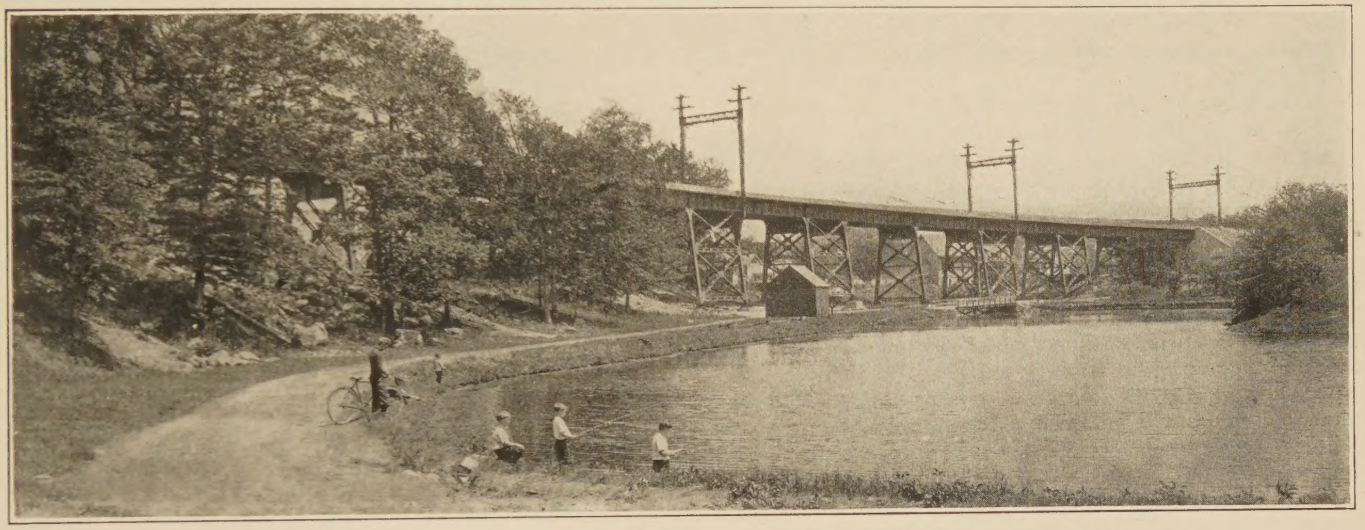
100 ft. wide over the roof of this structure. The longer four-track viaduct, which is located at 180th Street, New York, is partly a deck and partly a through girder structure 2100 ft. long. It crosses seven streets and forms part of the 180th Street station. The four-track viaduct at the Columbus Avenue crossing over the New York, New Haven & Hartford Railroad also includes the longest railroad bridge, which has 116-ft. girders. The longest highway crossing, which is located at North Avenue, New Rochelle, is 138 ft. long.

An interesting example of the high construction standards of this railway, even in minor things, is shown in the accompanying view of a footbridge fabricated of steel and supported on concrete piers with heavy permanent concrete abutments.

A feature of all bridges except the older ones, which were



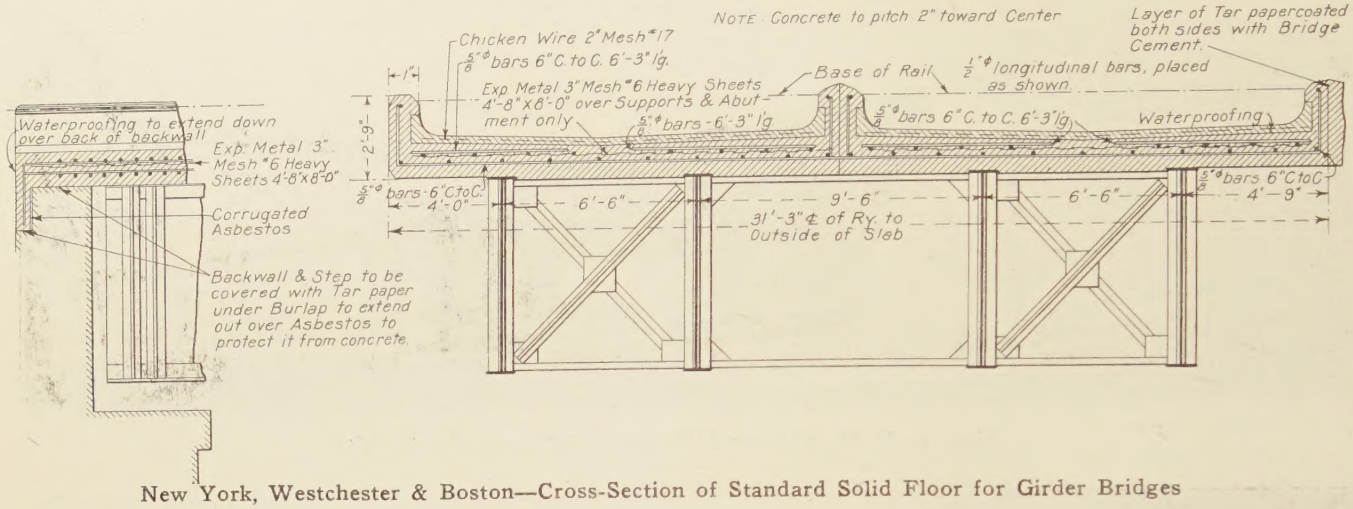
New York, Westchester & Boston—Viaduct at Morris Park



New York, Westchester & Boston—Steel Viaduct Near the Fifth Avenue Station

New York, Westchester & Boston—Highway Crossing in Pelhamwood

not deep enough, is the use of solid concrete floors. These floors are waterproofed in several ways. Thus, on one viaduct alternate layers of cement and burlap are used for this purpose. On deck structures the reinforced concrete


Note Concrete to pitch 2" toward Center
Layer of Tar papercoated both sides with Bridge Cement
Chicken Wire 2" Mesh #17
5/8" ϕ bars 6" C. to C. 6'-3" lg.
Exp. Metal 3" Mesh #6 Heavy Sheets 4'-8" x 8'-0" over Supports & Abutment only
Base of Rail
1/2" ϕ longitudinal bars, placed as shown
5/8" ϕ bars 6" C. to C. 6'-3" lg.
Waterproofing
Waterproofing to extend down over back of backwall
Exp. Metal 3" Mesh #6 Heavy Sheets 4'-8" x 8'-0"
Corrugated Asbestos
Backwall & Step to be covered with Tar paper under Burlap to extend out over Asbestos to protect it from concrete.
5/8" ϕ bars 6" C to C
4'-0"
6'-6"
9'-6"
31'-3" ℄ of Ry. to Outside of Slab
6'-6"
4'-9"

New York, Westchester & Boston—Cross-Section of Standard Solid Floor for Girder Bridges

slabs are covered with waterproofing, which in turn receives a top dressing of 3 in. of concrete. In other cases a layer of brick is set on edge in cement over the waterproofing. The standards for the track construction were prepared under the direction of J. L. Crider, chief engineer.

CONDITIONS GOVERNING STATION CONSTRUCTION

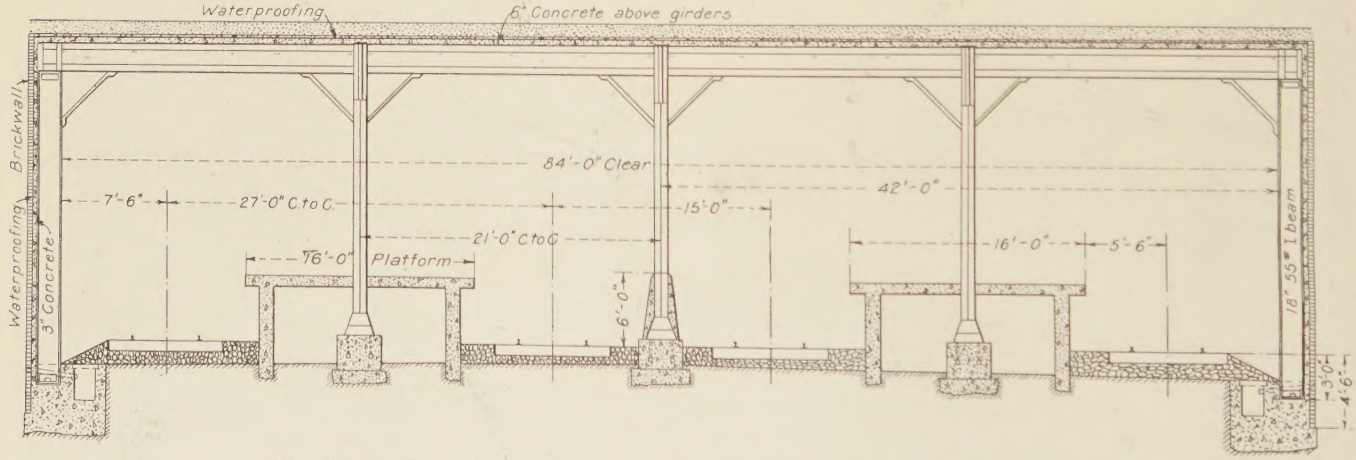
The passenger stations and signal towers may be said to constitute the most attractive group of way structures possessed by any electric or steam railroad in the United States. This result was made possible by the progressive attitude of the company, which was ambitious to erect buildings which would add to rather than detract from the expected high-class suburban development of this territory. At the same time, it was desired to have permanent structures that could be maintained at less expense than wooden or brick buildings. Furthermore, the conditions under which the right-of-way was obtained at many places made it good business policy to put up structures which, though larger than actually necessary for passenger handling, could be used in part for rental purposes. For this reason, many of the stations have cafés, haberdasheries and other stores in addition to the usual magazine and candy stands.

most economical but that it could also lend itself to great variety in architectural treatment. One of its principal advantages was that it could be tied in with retaining walls, thus giving an unbroken architectural effect and making impressive-looking structures of even the unimportant stations. Thus, the back of many stations is merely a continuation of the retaining walls, except that windows have been furnished in the walls of the platforms to avoid the ugly effect which would be given by blind walls seen from outside the station. Many forms of construction were necessary, as some of the station structures are below the track level, others alongside the track and still others over the track.

Three distinct orders of architecture have been employed, namely, a modified Mission type from New York to East Sixth Street, Mount Vernon, and between Columbus Avenue, Mount Vernon, and New Rochelle; simplified Italian Renaissance on the White Plains branch, and Classic at the Third Street Station, Mount Vernon. A careful analysis of the possibilities of concrete for railway station use and the adoption of simple, though attractive, outlines made it possible to erect these structures for about 25 per cent less than the cost of similar buildings in the vicinity of New York.

CONSTRUCTION OF STATIONS

The constructional features common to all the stations



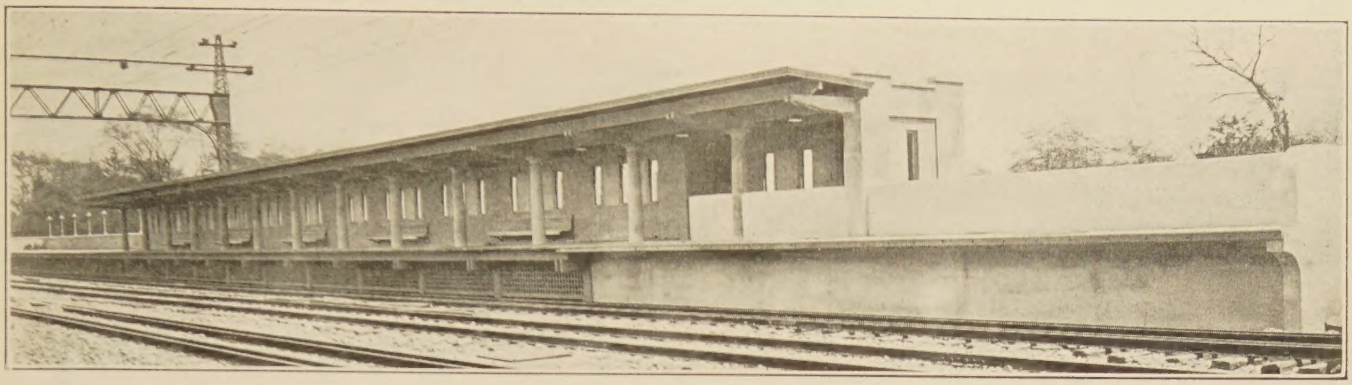
New York, Westchester & Boston—Cross-Section of Subway at Stations

Some stations also have a room for baggage handling. At certain places the station building is being utilized as a natural headquarters for the local real estate development. The stations, platforms and signal towers were designed by Reed & Stem, New York.

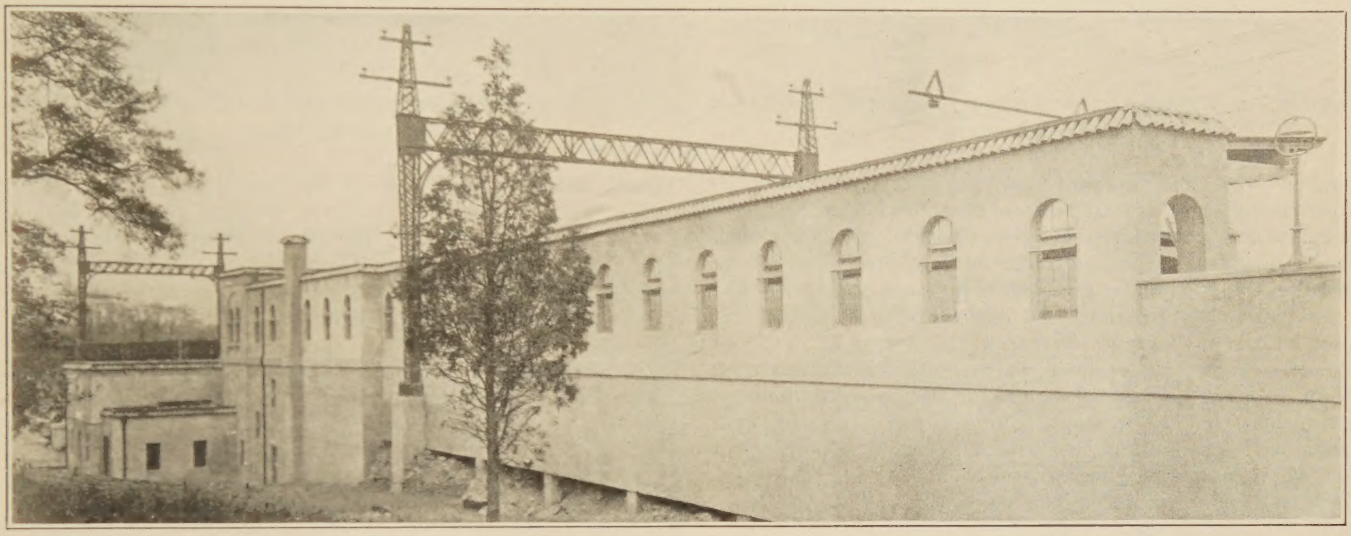
A study of different materials showed that concrete, plain or reinforced, according to conditions, was not only the are the use of concrete for the building walls, stairways and platforms. Hollow tile and cement are also used for walls and partitions. No exposed steel is used anywhere, except at North Avenue, where the vibration of the steel viaduct made the use of concrete impracticable. The fire-resisting qualities of all buildings are very high, as no wood is used in them except for doors and window frames. A material

which combines attractiveness and cleanliness is the terrazzo facing which is used for all station interiors, including the ticket booths. This material can be easily washed with soap and water. Announcements can readily be pasted on it and as readily washed off when they become out of date.

The entrances and exits to all station buildings have been laid out to future permanent grades, and where feasible a concourse for vehicles has been provided. The attractiveness of the stations is being enhanced also by the planting of trees, shrubs and hedges around them. The plants chosen are of hardy types which will require little or no care for maintenance. The station platforms, except over fills where no permanent foundation could be secured, are constructed of concrete slabs 6 in. thick. They have a wooden edging 3 in. thick to protect them from chipping, the top of this edging consisting of 1-in. material which can be easily removed by sections without injuring the rest of the platform. The entire edging can be taken off, however, should it be desired to operate freight trains over this line eventually. All station platforms are placed 3¾ in. below the level of the car platform to allow for the wear



New York, Westchester & Boston—Typical Station Platform



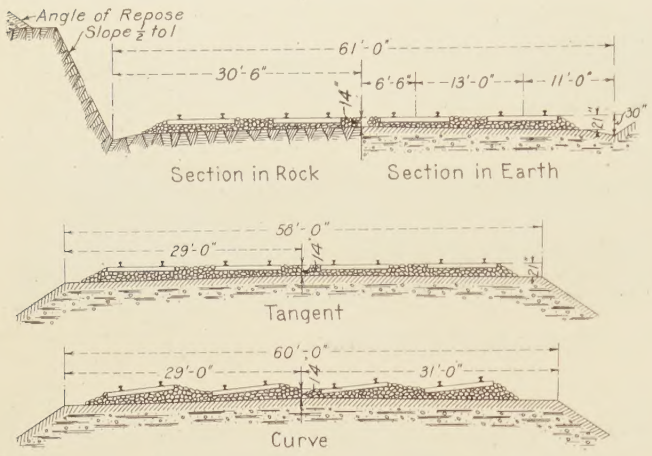
New York, Westchester & Boston—Typical Station Located at a High Embankment

New York, Westchester & Boston—Front View of Station Located Over Four-Track Line, Showing Store Frontage

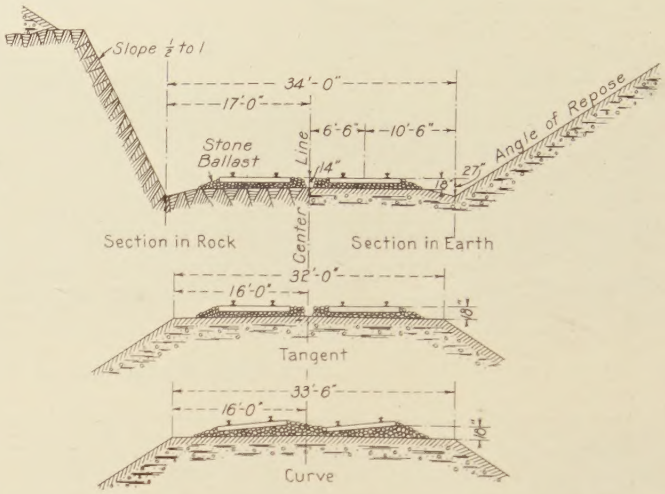
on wheels and bearings. Another interesting detail of the platform arrangement is that the benches are carried directly from brackets in the walls so that there are no legs around which dirt can accumulate.

All platform canopies, except at North Avenue, are carried on Doric columns, which are cast in cement. The platform walls, which are of the same construction as the floors, are invariably furnished with wired-glass, movable, steel-framed windows which serve the twofold purpose of giving additional light and air circulation in warm weather. The usual haphazard location for billboard advertising on station walls and interiors has been abandoned in favor of standard-size sinkages which are surrounded by a flush brass frame. These panels take two sizes of posters, namely, 2 ft. 6 in. x 3 ft. 10 in. and 3 ft. 6 in. x 7 ft. This method, combined with spacing, will give the station advertising a very attractive appearance.

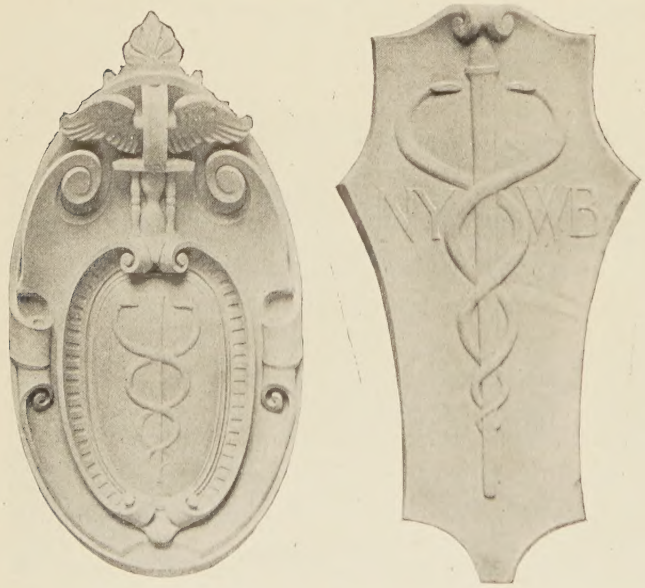
Some unusual constructions were necessary in order to secure continuity by using concrete wherever possible. An interesting case is a cantalever butterfly-type shed built of concrete reinforced with steel rods, which has the unusually large overhang of 8 ft. This shed, which is installed at the Sixth Street Station, Mount Vernon, was shown on page 867 of the ELECTRIC RAILWAY JOURNAL for May 25.



New York, Westchester & Boston—Standard Four-Track Roadbed Sections



New York, Westchester & Boston—Standard Double-Track Roadbed Sections

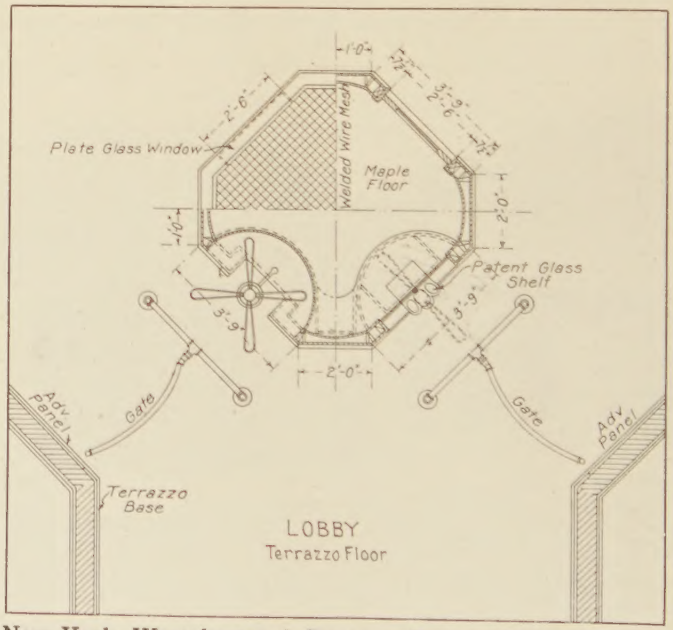


New York, Westchester & Boston—Emblematic Decorations Used on Stations, Bridges, Etc.

THIRD STREET STATION, MOUNT VERNON

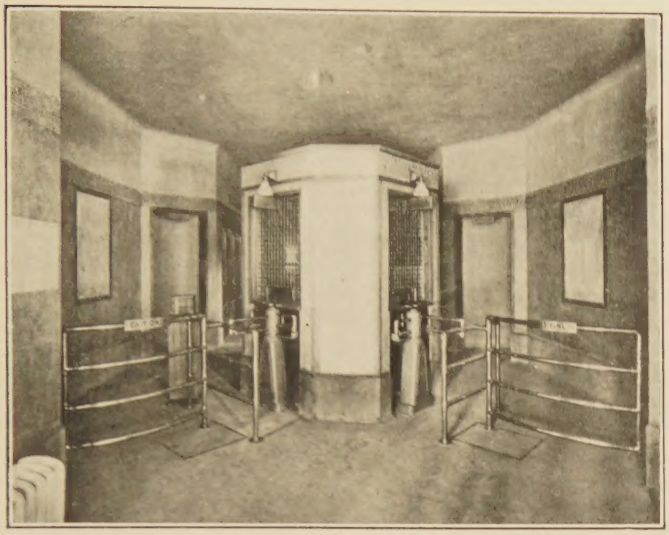
The number of the stations is so large and their arrangement so diverse that it would be impracticable to describe them individually. A few points may be noted, however, in connection with the classic design of the station at Third Street, Mount Vernon, which was illustrated on page 868 in the ELECTRIC RAILWAY JOURNAL for May 25. This building is particularly notable for its handsome arcade which serves a double purpose as follows: It gives access to the station proper, which was of necessity placed at the rear of the property, and it has made possible the utilization of the front portion for store space under such favorable terms that the rental is sufficient practically to cover the fixed charges on the investment. The stores and passages are so laid out as to give three frontages for the display windows.

Marble was used for the arcade columns, partly to obtain a pleasing contrast with the concrete and cement and partly to avoid the unsightliness which concrete quickly assumes from discolorations, chipping and other disfigurement. Instead of the customary volutes of Italian Renaissance columns, each cap has a Mercury head and wings which form a very appropriate emblem for a high-speed railway. The same motive was worked in one of the cast cement car-

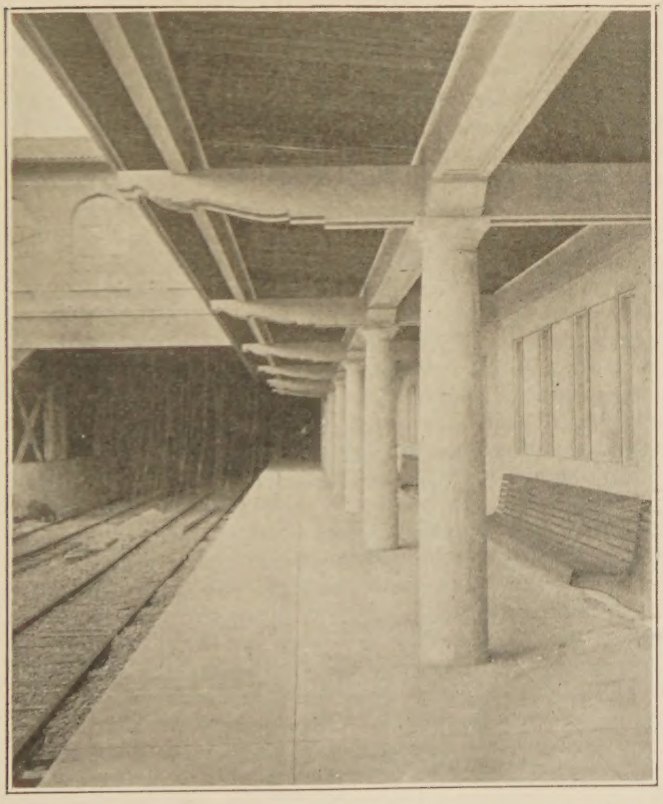


New York, Westchester & Boston—General Plan of Ticket Booth

touches in the pediment over this and other stations, where a Mercury staff, hourglass and winged wheel were used for decorative treatment. The other cartouche consists simply of a Mercury staff and the initials of the company. Of two circular designs, which are also used for the embellishment of this company's stations, but which are not illustrated, one consists of an acorn and oak leaf motive to signify strength, a sheaf of wheat for plenty and a Mercury staff for speed, while the second consists of a conventionalized oak tree and cornucopia. All ornamentation is confined to these simple and appropriate motives.



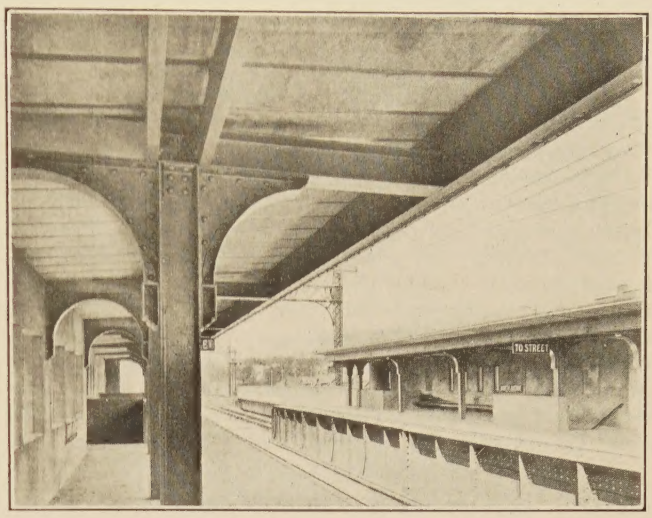
New York, Westchester & Boston—Interior of the North Avenue Station



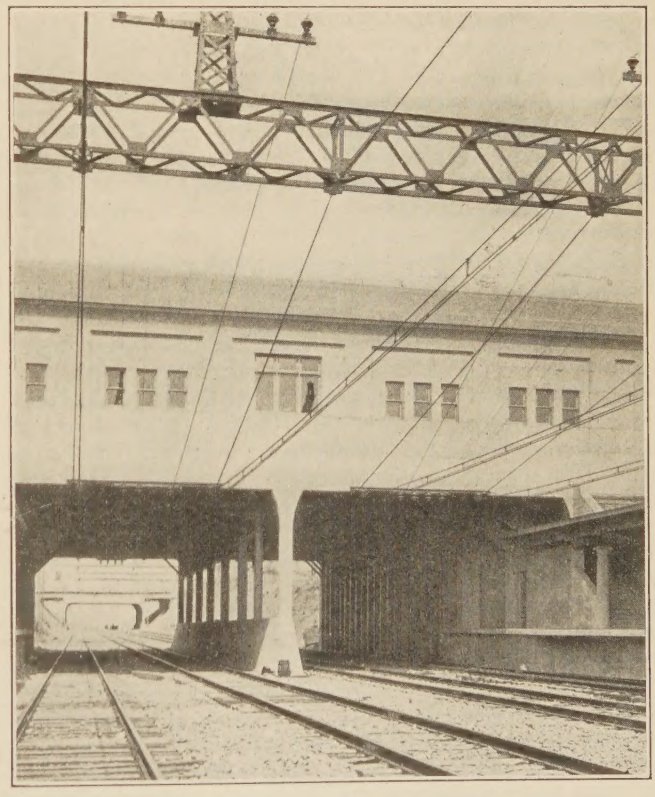
New York, Westchester & Boston—Typical Station Platform Showing Benches on Wall Brackets

OPERATING AND MAINTENANCE FEATURES OF STATIONS

In designing the stations and platform construction due consideration was given to adapting them for heavy passenger traffic. For this reason the stairways and passageways between the platforms and ticket rooms are 8 ft. wide. All stairways are of concrete covered with Mason safety tread. The movement of passengers is also greatly facilitated by an efficient arrangement of ticket-booth turnstiles and exit gates. As shown in an accompanying plan and halftone illustration, passengers enter through turnstiles either to the right or left, according to their direction of travel. These turnstiles are usually of the Langslow reciprocating arm type and were chosen on account of their compactness and rapid action. The passengers who depart from either platform through the ticket office must pass through the exits, which normally are closed by curved tubular gates. On leaving they drop their tickets in Cleveland ticket boxes. The opening and closing of these gates, as well as the operation of the turnstiles, are controlled from the ticket



New York, Westchester & Boston—Platform at North Avenue Station



New York, Westchester & Boston—Rear View of Station Over Four-Track Line

booth. It will be observed from the plan and the view of the North Avenue station that these ticket booths are radically different from the usual wooden structures. Instead of small apertures for ticket selling, ample windows are provided on every side to give the ticket agent a comprehensive view of what is going on in the station. The booths are constructed to harmonize with the rest of the station interior.

LIGHTING AND HEATING OF STATIONS

Provision has been made for heating the stations by steam where basement room for boilers is available. Elsewhere hot-water heating will have to be used. Current for lighting stations is obtained from the main power feeders by stepping the 11,000-volt current down to 220 volts through duplicate transformers at each station. A rather interesting detail is the type of platform lighting fixtures which was devised to avoid the unsightly effect of the ordinary gas-pipe gooseneck fixture. The new fixture consists of a wrought-iron pedestal through which the conduit is carried to form a circle from the apex of which the lamp and shade are carried. The pedestal has a switch chamber to which easy access is secured. These fixtures cost complete with shade about $12 each.

CHICAGO ELECTROLYSIS PREVENTION DISCUSSED IN CHICAGO

In the continuation of the discussion of the prevention of electrolysis in Chicago between the city electrician and the representatives of the surface and elevated railways before the committee on gas, oil and electric light of the City Council, on June 4, some additional interesting information was presented. Ray Palmer, city electrician, announced that he had revised his former estimate on the cost and operation of the negative booster return system from cost data furnished by the Board of Supervising Engineers. He figured that the surface lines could be properly protected for $2,737,980, which included 20 per cent contingencies, and that the addition of $1,600,000 would properly equip the elevated roads. His estimate was based on a maximum kilowatt capacity of 123,000 kw, which amount was based on a fifteen-hour winter maximum demand schedule and a five-hour summer schedule. Therefore his total estimate, as revised, was $4,337,980, or approximately $462,000 below his original figures.

W. W. Gurley, counsel for the Chicago Railways Company, asked Mr. Palmer whether if the negative booster system was installed the proposed ordinance would be satisfactorily complied with. Mr. Palmer answered in the affirmative and went on to add, in explanation of his estimate, that the information on which he based it was not so accurate as it should have been but was liberal. He stated further that he had met refusal in an attempt to secure additional information from the electrolysis committee, whose work was referred to in the report appearing in the Electric Railway Journal for June 1, page 921, and suggested that a member of the city electrician's staff be made a member of the electrolysis committee.

Ralph H. Rice, electrical engineer Board of Supervising Engineers and chairman of the electrolysis committee, said that the data obtained by this committee could not be furnished to the city electrician because it was obtained under an agreement among the various members that no information would pass out of their hands unless all members approved. In explanation of the committee's organization Mr. Rice said it was composed of nine members representing the Chicago Telephone Company, the Commonwealth Edison Company, the People's Gas Light & Coke Company, one member from each of the two surface railway companies, three members representing the five elevated railway companies and one member from the Board of Supervising Engineers. Correct data could not have been obtained without the unrestrained co-operation of the various public utility companies named, and the only way to get their assistance was by making the agreement, which was perfectly proper in view of the value of the data as evidence in lawsuits. At this point it was generally agreed that the committee on electrolysis could not be expected to assist the city electrician by furnishing him with its data, but the various members offered to help him in every way they possibly could.

Alderman Long then asked if any estimates of the amount of damage due annually to electrolysis had been made. Mr. Palmer answered in the affirmative and proceeded to read the following estimated figures: Annual maintenance cost of waterpipes due to electrolysis, $274,000; annual loss to cable sheathing of Sanitary District distribution system, $34,000; Chicago Telephone Company's loss to cable sheathing, $140,000; gas company's annual pipe maintenance, $158,000; Commonwealth Edison Company's loss annually, $6,000; making a total estimated loss of $612,000, or 5 per cent on $12,250,000.

In conclusion, he said that if it cost only $4,337,980 to install the negative booster system, figuring on a basis of this estimated loss it would certainly be a profitable investment.

In reply to Mr. Palmer's estimated loss figures, E. J. Blair, electrical engineer of the elevated railway companies, was able to show that the city electrician had not made sufficient actual investigation to furnish a correct basis for his estimate. Mr. Blair also advised that the data obtained at one point relative to damage by electrolysis would not hold at another, so that accurate figures as to the amount of damage were impossible to obtain unless all piping and conduit systems were uncovered. Mr. Blair also showed that in a specific case which the city electrician had investigated before and after a makeshift drainage system was installed the drop in potential had been reduced to below 8 volts.

H. M. Wheeler, assistant chief engineer of the Chicago Railways Company, then read a supplementary report in which he discussed the drainage system and the plans proposed by Mr. Palmer. He showed that at one time Mr. Palmer had approved of a drainage system. He also quoted from a paper on the drainage system which had been installed in Pittsburgh. This paper was published in the proceedings of the Engineers' Society of Western Pennsylvania in July, 1911. He went on to quote from a paper read recently by Burton McCollum before the American Gas Institute. Mr. Wheeler disagreed with the conclusions of Mr. Palmer as to the estimates of the cost of installing the different proposed systems and concluded by stating that the present condition of the surface lines in Chicago is not nearly so bad as has been claimed.

At the conclusion of Mr. Wheeler's report Mr. Palmer challenged the figures presented by the railway companies' engineers and said he felt confident that he could convince them that they were too high. To prove his statements relative to the annual loss to the various public utility companies, Mr. Palmer asked that men of authority from each be requested to appear before the committee on gas, oil and electric light. Relative to his former statements referred to in Mr. Wheeler's report, Mr. Palmer acknowledged that he was wrong in approving the drainage system at that time. In view of his experience since then he had changed his mind and now thought that anything except a negative booster system was only a makeshift. At this point further discussion was postponed until June 13, and B. J. Arnold was requested to appear before the committee at that time.

The high efficiency of the condensing steam turbine has overthrown the belief that cheap fuel necessitates the use of non-condensing power plants, and it is now not unusual to find cooling towers installed in coal-mining districts.

Important Transmission Case Before the Public Service Commission of Ohio

Abstract of Testimony Given by Expert Engineers in the Electrical and Telephone and Telegraph Fields—A Case Involving the Western Union Telegraph Company and the Cleveland, Painesville & Eastern Railroad Which May Set a Precedent Relative to High-Voltage Transmission Lines Paralleling Low-Tension Lines

A question of the right to parallel low-tension with high-tension transmission lines has arisen between the Western Union Telegraph Company and the Cleveland, Painesville & Eastern Railroad Company, the former being the complainant and the latter the defendant. The case has been put before the Public Service Commission of the State of Ohio by the Western Union Telegraph Company, which prays that the railroad company shall be compelled to move its transmission line from its own right-of-way, which was purchased adjoining the right-of-way of the Lake Shore & Michigan Southern Railroad on which the telegraph company had constructed its line. The complainant sets up the claim that such parallel construction of the two lines is a grave menace to the welfare of the public and that there is great probability of a cross of the low-tension and high-tension lines due to mechanical failure of the latter, which would result in widespread death and destruction.

DESCRIPTION OF TRANSMISSION LINE

The transmission line in question, as stated, parallels the telegraph line for 7 miles between Willoughby and Painesville, Ohio, and has been constructed on private right-of-way adjoining the Lake Shore & Michigan Southern right-of-way. The poles carrying the transmission line vary in height above the ground from 33½ ft. to 43½ ft., with an average span of 120 ft. A single cross arm 6 ft. long supports the three wires, which are tied to Ohio Brass Company's two-petticoat insulators spaced 22 in. on centers. The wire is No. 3 hard-drawn copper, carrying 13,000 volts a.c. Applied to an angle securely bolted to the pole and extending 3 ft. above it is a No. 6 iron ground wire which is grounded every ten poles. The ground is secured through a No. 4 copper wire which is stapled to the side of the pole and is coiled around the butt. Located 8 ft. below the transmission-line cross-arms two wooden brackets have been applied to the side of the pole for supporting a No. 10 galvanized-iron telephone wire. The line construction conforms to the requirements of the American Electric Railway Association transmission-line specifications.

DESCRIPTION OF TELEGRAPH LINE

The telegraph lines are supported on poles averaging about 25 ft. above the ground and spaced at 150-ft. intervals. Each pole carries five cross-arms, 10 ft. long, to which have been applied Western Union pins with glass insulators to carry thirty-one wires. Some of the wires are bare copper, others are galvanized iron, and thirteen wires are weatherproof lines used by the railroad company for its automatic block signals. For a short distance through Painesville the number of wires has been increased to about forty-five on eight cross-arms.

The telegraph line is located on the north side of the railroad company's right-of-way from a point 1 mile west of Mentor to the Baltimore & Ohio Railroad crossing in Painesville, a distance of approximately 6 miles, and from a point in East Painesville to a point in West Painesville, a distance of ¼ mile. At a point ½ mile west of Mentor and extending east for ten span lengths, the telegraph line leans over the Lake Shore right-of-way from 2 ft. to 3 ft. For ten spans the horizontal separation is from 4 ft. 5 in. to 6 ft., for the next thirty-two spans the separation varies from 6 ft. to 8 ft., for the next 121 spans the separation varies from 8 ft. to 10 ft., for the next sixty-three spans from 10 ft. to 12 ft., for the next forty-eight spans from 12 ft. to 40 ft. The remainder of the line is separated horizontally by a distance in excess of 40 ft., except at two points where the lines cross, and here the approved overhead crossing specification has governed the character of construction. The high-tension line is higher than the telegraph lines at all points, except at the points of crossing, and the closest vertical clearance is 5½ ft.

WESTERN UNION COMPANY'S COMPLAINT

The complaint filed with the commission by the complainant, the Western Union Telegraph Company, is as follows:

(1) The high-tension line is dangerous on account of sleet storms, high winds, liability of high-tension wire falling on telegraph wire, endangering employees, destroying instruments, apparatus and buildings of railroad and telegraph companies.

(2) In many cases the wires of the defendant are so close as to endanger when slackened from ice and swayed by wind, thus producing contact.

(3) There is danger of collision or derailment of trains of the Lake Shore Railroad breaking down poles and allowing low-tension wires to fall on transmission wires.

(4) Numerous other causes might make line fail mechanically.

(5) Even if there was assurance that the existing construction was safe, the wire would deteriorate and become dangerous.

(6) The Painesville company has not followed good engineering practice in constructing its lines and should be compelled to move them to a distance from the telegraph company's lines equal to the height of the tallest pole in either line.

(7) The telegraph company's lines were constructed on the railroad company's right-of-way under contract and by virtue of federal statute which authorizes telegraph companies to construct their lines along railroad rights-of-way.

(8) The Painesville company has made a short cut across country on its pole-line right-of-way and owing to the fact that the present case is before the commission has not used the line in question for transmission purposes.

STATEMENT BY CLEVELAND, PAINESVILLE & EASTERN RAILROAD COMPANY

The attorneys for the Painesville company told the commission that they saw an old complaint in a new guise. The telegraph company's real purpose in this case is to reduce induction, but it is using the claim of danger as a new form of complaint. The history of the construction work on the Cleveland, Painesville & Eastern Railroad Company leading up to the construction of its transmission line is as follows: The power house at Willoughby had become antiquated and out of date and had to be replaced with a new one. As the railroad company had extended its lines east of Willoughby to Ashtabula the proper place to erect a new power house was evidently at Painesville so that the trolley lines could be fed both ways from this point. Early in 1911 the Painesville railway determined to make the improvement outlined, which consisted of building a new power house at Painesville and enlarging its capacity so that the necessary power for the entire line of railway could be transmitted to substations east and west of that point, using the old Willoughby power house as a substation. The railway from Painesville to Willoughby is not straight but follows the Euclid Road, which is lined on both sides with

large shade trees. The fact that the trees were there and that the existing line of railway was crooked caused the company to seek a new location. The nearest feasible straight line between the two points was taken. As the expensive farms which are found in this territory had already been cut by the Lake Shore & Michigan Southern Railroad and the Toledo, St. Louis & Western Railroad rights-of-way, the practical place to locate the new transmission line was on a private right-of-way adjoining and on the north side of these rights-of-way. In fact, it was the only location the company could purchase at a reasonable price per acre. The line could not be constructed along the south side of the steam roads' right-of-way because that side adjoined the back yards of a number of fine suburban homes. The transmission line as laid out crosses over the Lake Shore tracks near Painesville and also crosses some parcels of land which the steam railroad company owns outside of its right-of-way. The Western Union Telegraph Company and the Lake Shore & Michigan Southern Railroad Company were approached concerning these crossings, and after considerable time had been consumed in negotiations an agreement was reached covering the manner of crossing. After the transmission line was completed in compliance with the terms of the contract the telegraph company filed a complaint with the Public Service Commission. Practically the same standards of construction were used on the transmission line constructed at another point between Painesville and East Painesville which has been in operation for over eight years with no trouble either through storms and mechanical failures or through complaint on the part of the telegraph company.

TESTIMONY BY RAILROAD WITNESSES FOR TELEGRAPH COMPANY

Among the first witnesses who took the stand for the telegraph company were William L. Thompson, telegraph pole-line inspector for the Western Union Company at Cleveland; John W. Kohnigsmark, division wire chief of the Western Union Company, Chicago, and Wallace W. Ryler, general superintendent of telegraph New York Central Lines west of Buffalo. These witnesses merely furnished testimony relative to the telegraph-line construction location, the purpose of such lines and the number of instruments, apparatus and employees that might be affected by contact between these telegraph lines and the transmission line. They were also asked for specific instances of power lines coming in contact with telephone or telegraph lines but were unable to furnish any testimony of this character.

TESTIMONY OF MR. OSGOOD

By far the most important witness for the telegraph company was Farley Osgood, general superintendent of the Public Service Electric Company of New Jersey. After qualifying as an expert Mr. Osgood said that he had personally investigated the lines in question and considered the existing conditions as an ever-present, increasing and hazardous menace. In explanation of this he said the hazardous condition was due to deterioration of the wooden poles and the changing conditions of the ground in which the poles were set, with particular reference to climatic conditions, meaning heavy rains and natural changes due to the swing of the seasons. All would tend to make the line less stable and more easily broken or blown down. In answer to a question about the safeguards used in constructing the Painesville company's transmission line he said that it was not properly safeguarded when it assumed a position of overbuilding, as was the case at some points along the line in question. He said the high-tension line was so located that in case of failure it would fall on the telegraph lines. It might fall owing to wind storms or sleet storms; poles might be broken down or blown over; the wires themselves might be broken by sleet storms, and particularly the overhead ground wire might fall from the same causes; the high-tension wire might fail mechanically or as a result of arcs from shorts; the insulators might fail mechanically or as a result of malicious acts of people or unintentional acts of gunners; the insulators might fail electrically; the pins might fail from undue strain during storms; the cross-arms and poles might be set on fire from arcs; the ground wire, being small, was very likely to fail from natural mechanical weakness; the smoke and gases from locomotives have practically no effect on the transmission wire but have a very deteriorating effect on insulators and iron wire. In reply to a question as to whether the transmission line could remain where it is now located and be made safe, Mr. Osgood expressed his opinion to the contrary. He said the minimum safe distance should be not less than the height of the tallest pole used in the two lines and might well be the distance of the longest span. He said further that he considered the existing construction good enough if it were not for its proximity to the telegraph lines but took exception to the size of the ground wire and the method of tying it to the angles which are at the tops of the poles. He said he did not consider the efficiency of the ground wire very great owing to its size and the method of attachment to the angles which support it. The tie wires permitted the ground wire to chafe against the angle when it is swung by the wind, creating the possibility of short-circuits and crosses between the power line and the adjacent telegraph lines.

At this point Mr. Osgood was questioned relative to specific instances of high-tension line failures that had come in contact with low-voltage lines, causing damage to instruments, setting fire to buildings and injuring people. Mr. Osgood was able to furnish information relative to a number of cases where a failure in transmission lines had caused damage to low-voltage lines. The question of the ability of circuit breakers properly to take care of these failures was then taken up, and Mr. Osgood testified that there was none now in use which did not require an appreciable lapse of time to act, and until one was devised which would act instantly he did not think they were of any particular value in saving property and lives of people who might be endangered when the transmission lines were brought in contact with lines of low voltage.

In the cross examination of Mr. Osgood which followed it was shown that some of the cases of transmission-line failure which he mentioned were where the transmission lines were on the same poles with the low-tension lines. It was also shown that Mr. Osgood used standard construction in the five cases mentioned and was responsible for the lines when they failed. It was also shown that none of the cases of transmission-line failure mentioned by Mr. Osgood was exactly a parallel case to the one before the commission. He also gave evidence that this company's insulators were for 22,000 volts a.c. when only 13,000-volt insulators were necessary.

Following the cross-examination of Mr. Osgood he was re-examined by the attorneys of the Western Union company and the set of standard overhead crossing specifications drafted by the American Electric Railway Association was submitted as evidence.

OTHER TESTIMONY FOR TELEGRAPH COMPANY

Following Mr. Osgood, G. A. Cellar, superintendent of telegraph Pennsylvania lines west of Pittsburgh and president of the Railway Telegraph Superintendents' Association, was called. Mr. Cellar furnished evidence relative to the extent of damage which might result from a broken high-tension line coming in contact with the telephone and telegraph lines. He also furnished evidence of what might cause a break in the transmission or telegraph lines and said that from his experience in this territory the transmission line, being on the north side of the telegraph line, was on the side of the prevailing winds, which made its location more dangerous.

R. W. Whitehead, division plant superintendent of the Western Union Telegraph Company, furnished evidence

of the danger of the existing conditions. In questioning him the attorneys for the telegraph company brought out a new cause for failure of pole lines along steam road rights-of-way, that is, failures due to grass fires.

Francis E. Cabot, secretary of the Boston Board of Underwriters and engineer for that body, read from the National Electric Code the rule governing the construction of constant-potential pole lines over 500 volts. He said that it was framed with special reference to fire hazard and that the transmission-line construction in question did not comply. He also expressed an opinion relative to the danger of the existing condition to persons and property.

Gustav Hirsch, consulting engineer, Columbus, was then called to the witness stand and furnished additional testimony relative to the dangerous location of the transmission line.

Prof. Charles F. Scott, of the electrical engineering department Sheffield Scientific School, Yale University, also furnished evidence relative to the dangers existing on account of the proximity of the two lines in question.

R. E. Chetwood, Elizabeth, N. J., engineer of construction for the Western Union Telegraph Company, was also questioned relative to the danger to life and property and why it existed along this particular piece of construction.

TESTIMONY BY WITNESSES FOR ELECTRIC RAILWAY COMPANY

At this point the attorneys for the Western Union company rested, and witnesses were called by the Cleveland, Painesville & Eastern Railroad. Robert O. Rote, principal assistant engineer of the Lake Shore & Michigan Southern Railway, was the first witness to take the stand and was examined relative to the location of the line and the reasons for purchases of certain additions to the railroad company's right-of-way and the moving of the telephone and telegraph pole lines on the new strip of right-of-way. It was shown that the Lake Shore company had recently purchased an additional strip of right-of-way just previous to the purchase of the right-of-way made by the Painesville company, and that the telegraph company's lines had been shifted to a new location. This brought them to a point where they actually extended over the Lake Shore right-of-way to the right-of-way purchased for the transmission line.

Charles Rufus Harte, assistant engineer New York, New Haven & Hartford Railway, New Haven, Conn., in charge of location and crossing of foreign transmission lines on the New Haven road, in reply to a question informed the commission that the transmission line was first-class construction and up to present standard practice; in fact, was in excess of the actual physical requirements. He considered that the existing conditions showed thorough and reasonably safe construction and furnished evidence that any tendency of hard-drawn copper wire to coil and curl when broken disappeared when it has been in position a short time. He said that his experience had been that it would fall as a bar when it was coated with ice or if it should fail mechanically. Mr. Harte told the commission that he had made a careful study of the strength of overhead lines and did not know of a single failure on his own lines due to sleet or wind. He said that the existing clearance between the telegraph and transmission lines in question was ample and that a sag could not come in the line due to sleet or wind which would cause contact, but that the remaining clearance when an extreme sag condition existed would be ample. In reply to a question relative to sags affecting the breaking strength of wire Mr. Harte testified that the size of the wire was designed for that purpose and its strength would not be affected At least, if an insulator or pin should fail the wire was sufficiently strong so that it would still hang free, even though the span length was doubled. In fact, his experience had been that lines that had no business to stand up theoretically had done so invariably under heavy sleet storms and in wind storms. In reply to a question relative to the effect of deterioration on transmission lines he said that it always occurred with any character of construction. If a line was neglected there was no question that its strength would depreciate. Mr. Harte was also able to furnish evidence relative to what would happen in case of a pole failure due to wind pressure. He said that in almost every case the pole does not fall with the wind but kicks back, and he knew of some cases where it had actually fallen in the direction from which the wind was coming. His experience also showed that most pole failures occurred about one-third the distance up from the ground.

As Mr. Harte and Mr. Osgood had constructed and maintained transmission lines in the same section of the territory, the attorneys for the Painesville company brought out the fact that the transmission-line failures described by Mr. Osgood were lines constructed along old standards with defective insulation. At the close of Mr. Harte's testimony a number of photographs showing cases where a transmission line paralleled telephone and telegraph lines were submitted in evidence.

Following Mr. Harte's testimony Paul N. Lincoln, electrical engineer Westinghouse Electric & Manufacturing Company, was called. In order to offset Mr. Osgood's testimony relative to circuit breakers, Mr. Lincoln was questioned along this line particularly. He told the commission that circuit breakers could be set to break at any current or time as short as a half second. He did not agree with Mr. Osgood's statement as to the time of operation of the circuit breakers used in the power house which controlled the transmission line in question.

The next witness was Joseph G. Swain, superintendent of power and shops of the Cleveland, Painesville & Eastern Railroad Company. As Mr. Swain had designed and had charge of construction of the transmission line in this case, he was questioned concerning the methods of construction and the conferences which he had had with the telegraph company and the Lake Shore Railroad company relative to the overhead line-crossing contract. One point of interest which Mr. Swain mentioned was that all the poles and cross-arms had been treated by boiling them in high-grade creosote oil.

Lemuel S. Boggs, superintendent of electrical construction New York, New Haven & Hartford Railroad, New Rochelle, furnished evidence that the transmission line as constructed by the Painesville company was similar to construction he had employed and was standard practice. William Roberts, Akron, Ohio, superintendent of the Northern Ohio Traction & Light Company, also told the commission that he had similar cases of transmission-line construction and had taken precautions like those employed by the Painesville company.

FURTHER TESTIMONY FOR TELEGRAPH COMPANY

At this point the attorneys for the Cleveland, Painesville & Eastern Railroad Company rested and the Western Union attorneys called H. S. Warren, Montclair, N. J., adviser for the American Telegraph & Telephone Company. Mr. Warren was called in order to offset some evidence presented by the Painesville company's witnesses relative to the placing of telegraph and telephone wires on the same poles with high-tension wires.

With this testimony the case before the commission was closed, and at the present time the attorneys for the Western Union Telegraph Company have filed their briefs and the commission, before rendering a decision, is awaiting the briefs which will be filed by the attorneys of the Cleveland, Painesville & Eastern Railroad Company in the very near future.

The record of passenger train performance on the steam railroads of New York State for March, 1912, shows that during the month 63,517 trains were run. Of this number of trains run 72 per cent were on time at the division terminal. The average delay for each late train was 35.3 minutes, and for each train run was 7.9 minutes.

Rules for Resuscitation from Electric Shock

Rules Recommended by Commission, Representing American Medical Association, National Electric Light Association and American Institute of Electrical Engineers

The rules recommended by the committee on resuscitation from electric shock of the American Medical Association, the National Electric Light Association and the American Institute of Electrical Engineers have just been made public. The committee consists of Dr. W. B. Cannon (chairman), professor of physiology, Harvard University; Dr. Yandell Henderson, professor of physiology, Yale University; Dr. S. J. Meltzer, head of department of physiology and pharmacology, Rockefeller Institute for Medical Research; Dr. Edward Anthony Spitzka, director and professor of general anatomy, Daniel Baugh Institute of Anatomy, Jefferson Medical College; Dr. George W. Crile, professor of surgery, Western Reserve University; W. C. L. Eglin, past-president National Electric Light Association; Dr. A. E. Kennelly, professor of electrical engineering, Harvard University; Dr. Elihu Thomson, electrician, General Electric Company, and W. D. Weaver, secretary, formerly editor *Electrical World*. The rules appeared as a supplement in the large convention issue of the *Electrical World* dated June 1, 1912.

Fig. 1—Inspiration; Pressure Off

Fig. 2—Expiration; Pressure On

The explanation is made, however, that while these rules are subject to final revision following critical examination by electric men, it is probable that changes in the rules, if any, will relate merely to minor details. In addition, the commission has prepared similar rules more in detail, and including a section on the "First Care of Burns," which will be issued in the form of a flexible cloth-bound booklet suitable for the pocket. The rules prescribe the Schaefer method of artificial respiration slightly modified, following the unanimous decision of the commission that this method has superior advantages in simplicity, easy performance, large lung ventilation, little risk of injury to the subject and no trouble from the tongue falling back into the air passage. Both the chart and the booklet will be issued in large editions by the National Electric Light Association. Though copyrighted in order to prevent liberties being taken with the text, the association will, upon application from responsible quarters, grant permission to reprint the chart and booklet. The National Electric Light Association generously assumed all expenses incident to the work of compiling this information, but all of the members of the commission served without remuneration, and their zeal and the great ability which they devoted to the study of the subject of resuscitation and to the preparation of the rules just completed entitle them to the warm gratitude of the entire electrical fraternity.

The rules follow:

RULES ON RESUSCITATION FROM ELECTRICAL SHOCK

(Copyrighted 1912 by National Electric Light Association)

Follow these instructions even if victim appears dead.

I. IMMEDIATELY BREAK THE CIRCUIT

With a single quick motion free the victim from the current. Use any **dry** *non-conductor* (clothing, rope, board) to move either the victim or the wire. Beware of using metal or any moist material. While freeing the victim from the live conductor have every effort also made to shut off the current quickly.

II. INSTANTLY ATTEND TO THE VICTIM'S BREATHING

1. As soon as the victim is clear of the conductor, rapidly feel with your finger in his mouth and throat and remove any foreign body (tobacco, false teeth, etc.). Then **begin artificial respiration at once.** Do not stop to loosen the victim's clothing now; **every moment of delay is serious.** Proceed as follows:

(a) Lay the subject on his belly, with arms extended as straightforward as possible and with face to one side, so that nose and mouth are free for breathing (see Fig. 1). Let an assistant draw forward the subject's tongue.

(b) Kneel straddling the subject's thighs and facing his head; rest the palms of your hands on the loins (on the muscles of the small of the back), with fingers spread over the lowest ribs, as in Fig. 1.

(c) With arms held straight, swing forward slowly so that the weight of your body is gradually, but *not violently*, brought to bear upon the subject (see Fig. 2). This act should take from two to three seconds.

Immediately swing backward so as to remove the pressure, thus returning to the position shown in Fig. 1.

(d) Repeat deliberately twelve to fifteen times a minute the swinging forward and back—a complete respiration in four or five seconds.

(e) As soon as this artificial respiration has been started, and while it is being continued, an assistant should loosen any tight clothing about the subject's neck, chest or waist.

2. Continue the artificial respiration (if necessary, at least an hour), **without interruption,** until natural breathing is restored, or until a physician arrives. If natural breathing stops after being restored, use artificial respiration again.

3. **Do not give any liquid by mouth until the subject is fully conscious.**

4. Give the subject fresh air, but keep him warm.

III. SEND FOR NEAREST DOCTOR AS SOON AS ACCIDENT IS DISCOVERED

The following doctors are recommended:

Name.	*Address.*	*Telephone No.*

(Subject to final revision.)

THE USE OF STEEL TROLLEY WIRE

CONTRIBUTED BY A LINE ENGINEER

The Electric Railway Journal for April 6, 1912, contained a very important article entitled "Experiences with Steel Trolley Wire." The statement that the article referred to was an important one may surprise many persons, judging from the fact that the writer has heard several people say that the experiences of the seven companies quoted were so contradictory as to be valueless. However, if the various conditions under which the wire was worked are analyzed, some reasons may be found to account for the differences which were obtained in the life of the wire.

A close study of the original data would seem to indicate that the failure of the wire has been due to the pounding at the ears rather than to a high average wear, and that where the rigid supports have been removed the wire has shown better resistance to wear than with copper wire. This view of the case was held in Philadelphia. That it was correct would seem likely because the greater hardness of the steel would lessen the wear between the ears, but at the ears the increased arcing of steel wire would more than counteract its greater hardness.

A careful reading of the experiences given will show that the best results were obtained with catenary suspension, and particularly with the type used on the New York, New Haven & Hartford and the Chicago, Lake Shore & South Bend railroads. The Connecticut Company, which is closely related to the New York, New Haven & Hartford Railroad, did not have the same good results from the wire, but it must be remembered that most of the overhead work in question is of the three-point catenary type, in which the suspensions were usually about 50 ft. apart, and so does not have the same flexibility as on the other roads.

It might be said that the reports of the Trenton and Norfolk companies show that under the ordinary trolley wire conditions the steel wire was lasting better than copper wire would. In fact, this statement was made by the latter company. Nevertheless, the record in these cities is not so good as might be supposed from a hurried reading of the article, for the statement of the Trenton & Mercer County Traction Company shows that under a ten-minute headway the average wear on the wire was 0.0775 in. in three years. This does not, of itself, appear to be very much, but when it is remembered that the groove of the wire is only ¼ in. from the bottom, it will be seen that the life of the wire, even if it should wear evenly for its entire length and be worn down to the clips, would be only about ten years. This period is not long in such light service, even for a copper wire.

The report of the Virginia Railway & Power Company states that a No. 00 copper wire probably would have been worn out in two years under the service of 233,000 car movements. This would appear to be much more rapid than usual, as it is only an average of a four-minute headway for twenty-four hours a day. Although under actual conditions the cars would be run much closer together than this during most of the day yet under normal conditions two years would be considered as a very short life for copper wire even in such heavy service. However, under the service normally given on street railways, it would seem from the statements made that No. 0000 steel wire should last as well or a little better than No. 00 copper wire. If this result may be expected, why should not the steel wire entirely displace the copper wire, in view of its much cheaper first cost and possible longer life?

The answer to this question is that while steel wire will often be found cheaper than copper wire, yet this will not be invariably true. The determination with regard to economy will have to be made separately for each case, as the answer will depend not only upon the price for the wire when new but also upon its scrap value after its usefulness for the purpose of trolley wire becomes a thing of the past.

For several years trolley wire has sold at an average price of about 16 cents a pound while the price of steel wire is about 7½ cents. The usual figure ordinarily given for the weight of a mile of No. 00 copper is 2127 lb., which at 16 cents per lb. would amount to $340.32. Contrary to the usual belief, steel wire is lighter per foot than copper wire of the same section, and a mile of No. 0000 steel wire will weigh approximately 3000 lb., or about 10 per cent less than copper wire of the same size, and on the reels will cost $225. The erection of the two wires will cost almost the same, but the steel wire may cost slightly more because it is a little harder to handle.

From the foregoing it will be seen that the steel wire would appear to be about $115 per mile cheaper than the copper, but when the scrap values are taken into consideration this advantage will vanish. Suppose that the wires are left up until the average wear upon them amounts to 25 per cent, then the weight of the scrap will be 1600 lb. for the copper and 2250 lb. for the steel. The scrap copper can be sold for 12 cents per pound, or $192, while the steel wire will bring only about 3½ cents per pound, or $78.75. Therefore, if the life of the two wires is the same, the cost of the two kinds would be almost equal, assuming the prices given. It may be added that these prices would be too low according to present conditions.

It may be objected that if the No. 00 wire can be worn down to an average diameter of 75 per cent, or 275 mils, it should be possible to wear the No. 0000 wire to the same diameter or much below 75 per cent, especially as the tensile strength of the steel wire is higher than that of the copper. This might be the case if the wire would wear evenly, but, owing to the hangers, the unevenness of the track and to other causes, there is very little chance that this will ever occur. In practice it will be found that there are so many thin places when the wire has reached an average size of about 75 per cent that it will be advisable to renew all of it rather than to attempt to patch it.

Another cause that may lead to the discarding of the steel wire before it is worn down to a very small section is that on account of its high resistance it will burn down much more easily than will the smaller copper wire. Hence when breaks do occur in it they will probably be more serious than if they had occurred in copper wire. Again, if the wire is run under bridges, elevated structures or other places where the trolley poles can ground occasionally, the steel wire will suffer more than copper.

The resistance of steel wire is generally given as seven times that of copper of the same section. This will increase the voltage drop of the line to a considerable extent if the line is long and has little or no feeder wire in multiple with it; furthermore, the lower voltage will also be an indication of the greater line loss. Even if only the cost of the coal and water needed for the additional power is considered, it may be great enough to overcome any advantage that the steel wire would offer in the way of longer life or less first cost. Therefore before a company changes from one metal to the other an estimate should be made of the probable extent and cost of this energy loss. If the feeders already in multiple are heavy as compared with the amount of conducting material in the trolley wire, the latter will carry very little current except between the side feed spans where the cars are, and therefore the cost of power will not be increased to any extent.

In conclusion, it should be stated that this article has not been written to disparage the value of steel wire or to show that it cannot be made a source of economy. On many roads it has already proved to be more acceptable than copper. If the price of copper continues to rise, or if the price of the steel wire should be reduced, which would probably happen if its use should increase enough to cause several makers to take up its manufacture, it would prove to be at least a strong competitor of the present standard.

New Signal Equipment on the Indianapolis & Cincinnati Road

An Interesting Installation of Manually Operated, Remotely Controlled Car Signals

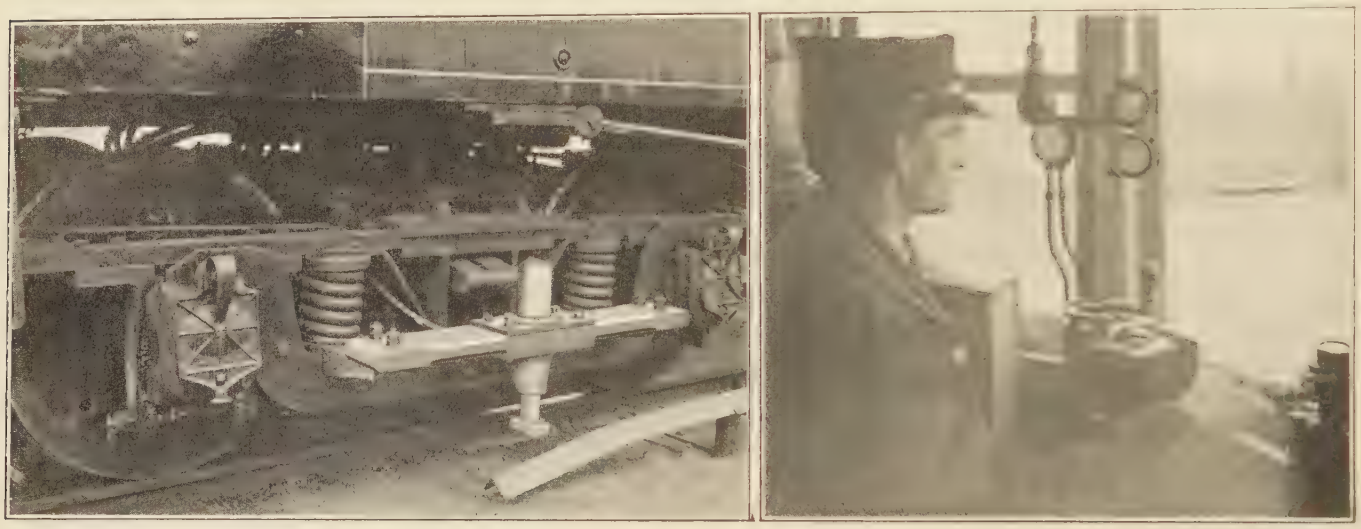
The Indianapolis & Cincinnati Traction Company, Charles L. Henry president, has just put into service a manually operated, remotely controlled interlocking signal system designed by P. J. Simmen and installed by Northey-Plummer, Ltd., Toronto and Indianapolis. This system affords means by which the dispatcher as a train approaches, passes or leaves a siding can display stop or proceed signals to the motorman. These signals are displayed by red and green lamps inside the cab, placed directly in the motorman's view. The signal-transmitting apparatus is interlocked so that it is mechanically and electrically impossible for the dispatcher to give signals corresponding to a lap order. Another strong feature of this system is that a permanent graphic record is continually being made in front of the dispatcher, showing at all times the position and direction of movement of all trains. This system of signaling has been in satisfactory operation for some time past on a Canadian road and has given excellent results.

The Indianapolis & Cincinnati Traction Company installation includes protection for nine blocks and ten sidings, each block extending from siding to siding and averaging about 2 miles in length. The most attractive features of this system are its simplicity, flexibility and elasticity. The principal electrical circuits consist each of copper-clad wire connecting three short sections of third-rail at each siding, with relays, control switches and a battery in the dispatcher's office. The return circuit is over the track rails. The system is designed on the normal danger plan; that is, if any part of the apparatus becomes deranged, stop signals are displayed. The apparatus on the car is very simple. It consists only of a third-rail shoe for making contact with the short signal rail, a relay and a small local battery for supplying energy to the signal lamps. Either a clear or a stop signal is always displayed before the motorman.

As long as written orders are considered essential in the control of train movements, neither the Simmen system nor any other will prevent the giving of wrong orders, written or oral, nor the wrong interpretation of orders correctly given. The Simmen system does, however, prevent the execution of such wrongly given or misunderstood orders as long as the motorman is capable of observing definite, visible, audible signals.

The disobedience of stop signals, which is possible on rare occasions through carelessness or fatigue, can only be prevented by the use of an automatic stop. It is intended shortly to make very thorough tests on the Indianapolis installation of an automatic stop especially designed for use with the Simmen system.

The only new rule required with the Simmen system is that when a motorman receives a red light he shall stop his train at the next siding and communicate by telephone with the dispatcher. A strong feature of this system is that the efficiency of the train crews in responding to signals can be effectively tested at any time by the dispatcher. The psychological effect of having a signal, red or green, continuously displayed in front of the motorman is thought to be an important feature as compared with signals which are placed along the right-of-way and must be "picked up" and read as they are approached. The motorman has the same view of a signal, regardless of whether the day is fair or stormy, because it is displayed in direct view within the cab.



Indianapolis & Cincinnati Signal Equipment—Third-Rail Contact and Cab Indicator

In connection with the display of red and green lights in the cab, as a means of telling the motorman when to stop or proceed, the local circuit includes a bell which is tapped whenever the signal is changed from red to green or vice versa.

PRINCIPAL PARTS OF THE SYSTEM

The principal parts of this system consist of a main control circuit leading from the dispatcher's office to each siding, a switch relay and battery connection in the dispatcher's office for each control circuit, three short sections of contact rail (about 72 ft. long) for each siding and a contact shoe relay, a local battery and two light signals (red and green) in each motor car. The control line for each siding is independent of the other control lines except that all of the dispatcher's switches (one in each control circuit) are mechanically interlocked.

MAIN SIGNAL CIRCUIT

One independent signal wire connects the three contact rails at each siding direct with the dispatcher's switchboard, and the return circuit is made through the track rails, which do not need to be cut. For the main signal circuit on this 18-mile installation copper-clad line wire has been employed. The wire, which is No. 14 gage, was chosen of this size not

because so great a conductivity was required, but because it was thought to be the smallest wire that would serve mechanically. The short lengths of contact rail are located one opposite the switch and two others 2000 ft. distant in each direction. The rail at the siding is called the home rail and the other two are called distant rails. By means of the two rails located 2000 ft. from the siding it is possible to give to the crew a signal sufficiently early to permit the stop to be made before the siding is reached. That is to say, if two trains are approaching a siding where they are to meet, they will receive red signals when 4000 ft. apart, and each train will yet have 2000 ft. distance remaining in which to come under control to make the siding stop.

The three third-rails at the siding are electrically connected by the single line wire, and this wire without other connection extends along the pole line direct to the dispatcher's office. This forms the main circuit for the siding. The circuit, on entering the dispatcher's office, passes through a knife switch, then through a fused lightning arrester, then through a 300-ohm relay and a dispatcher's control switch, and thence through a common 30-volt battery to a ground on the track rail.

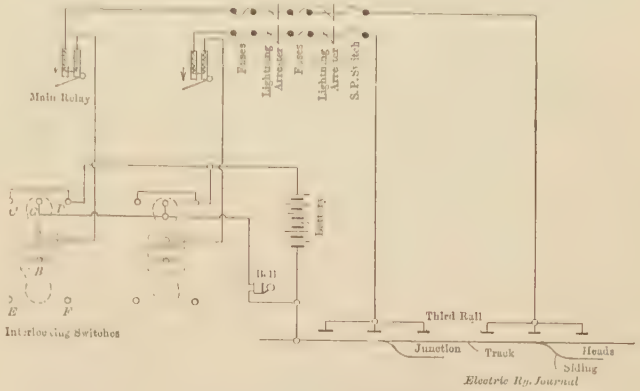
One of these main control circuits is installed for each siding, and only the parts enumerated are in circuit at any time. Each main control circuit normally is open at the track end, the opening occurring between the track rail and the short contact rail. When a car passes, the contact shoe attached to the side of the truck touches the contact rail. The circuit is then completed through a relay on the car and through the running gear to the rail. Thus the car relay is put in series with the relay and the dispatcher's control switch in his office.

The only part of the apparatus in this main circuit with which the dispatcher has anything to do, in normal operation, is the small control switch on his board by which the circuit can be opened or closed. There are ten of these switches in this signal installation, one controlling the main circuit leading to each of the ten sidings which protect the nine blocks. This switch consists of a single steel stem on

Indianapolis & Cincinnati Signal Equipment—Signal Control Board, Train-Recording Apparatus and Telephone Switchboard

which are mounted an interlocking segment and a contact piece which, as the switch is revolved through 45 deg. to the right or left, makes contact with either of three similar contact pieces fixed on a slate panel.

Referring to the diagram of the main circuit, two of these switches are shown by dotted lines. The contact points are lettered *C, G, D*. Point *A* is the line contact attached to the stem of one of the interlocked dispatcher's control switches. The three points with which this contact may be brought into connection are noted *C, G* and *D*. *C* and *D* are connected by a common wire leading through a battery to ground. Whenever the main switch moves its full amplitude to the left or the right, *A* and *B* or *A* and *D* are joined and the main circuit for the contact rail at the siding corresponding to this switch is energized. Current, however, does not flow because this circuit is yet open between the contact



Indianapolis & Cincinnati Signal Equipment—Diagram of Two Main Control Circuits

rail and the track rail at the siding. This circuit will be closed when the contact shoe of the car touches the contact rail.

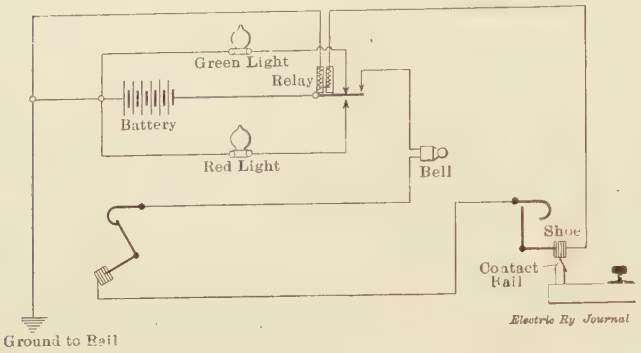
The center contact point *G* connects with ground, and thus whenever the switch is not being used to put the battery upon the line it grounds the line. A bell or other indicating device is put in ground connection so that the dispatcher instantly may learn when there is any foreign current of the circuit. Also, the short to ground tests out the control circuit each time the switch is used and discharges any static or stray dynamic current that may be on the line. This contact point also serves as an easy means for testing the current electrically.

During the erection of this signal system some experiments were made to determine the proper length of signal third-rail necessary to assure proper contact with the shoe on a car operating at speeds as high as 80 m.p.h. As a result the sections of third-rail used are, with few exceptions, 72 ft. long each. They are made of 3-in. x 3-in. x ⅜-in. angle iron mounted with the angle pointed upward, supported on forged wrought-iron pedestals and insulated from the pedestals by blocks of fiber and fiber bushings. The wire connecting the third rail with the control circuit on the nearby pole line is inclosed in wooden trunking to protect it against malicious or accidental damage.

CONTROL SWITCHES

As earlier stated, there is a dispatcher's switch for controlling the circuit to each siding. The position of the switch handles indicates what signal will be displayed on a car when its shoe touches any one of the three short sections of contact rail at or on either side of that siding. The arrangement of the board at the dispatcher's office of the traction company is such that the dispatcher faces north and has his back to the track. When any switch handle is turned to the left the westbound car at the siding controlled by that signal will be given a clear indication; when the switch handle is vertical the car in either direction will be given a stop signal, and when the switch hand is turned to the right an east-bound car will be given a clear signal. The row of switches controlling the signal indications at each siding is so interlocked that both east-bound and west-bound trains cannot be given clear signals for the same block. The nearest to each other that they can approach under clear signals is 4000 ft., or each train 2000 ft. distant from the same siding, when each will receive a red signal and have ample distance in which to stop before reaching the siding.

The interlocking means is very simple. It consists of a segmental shaped piece of steel about ¼ in. thick, keyed to the main stem of each of the dispatcher's control switch handles. These pieces interfere whenever attempt is made to turn two handles toward each other, and they assure that one handle must be in a vertical (stop signal) position between any two other handles that are pointing toward each other. That is, clear signals for east-bound and west-bound



Indianapolis & Cincinnati Signal Equipment—Diagram of Car Circuit

cars approaching each other can be given only when a stop signal is displayed at a siding between adjacent sidings set to "clear."

The psychological effect of placing before the dispatcher a continuous indication, as given by the position of the switch handles, of the running rights of all trains anywhere on the road is a most important feature of this signal system, especially when this feature is supplemented by a continuous record sheet indicating the position, direction and speed of all trains at all times.

CAR EQUIPMENT

The simplicity of the local circuit on the car is apparent when it is stated that this circuit includes only one relay, one local battery, two signal lights and a thoroughly constructed contact shoe. Each motor car carries two ground-glass signal lamps, mounted, one above the other, on a substantial frame attached to the window post in front of and just to the left of the motorman's position, as shown in an accompanying view. One signal glass is red, the other is green. Both are provided with small incandescent bulbs for illumination. Energy for these lamps is furnished by a small local battery. The other apparatus on the car, as shown by the circuit diagram, consists of a relay with two back contacts and one front contact and a contact shoe which is attached to the truck equalizer beams, as shown in the illustration.

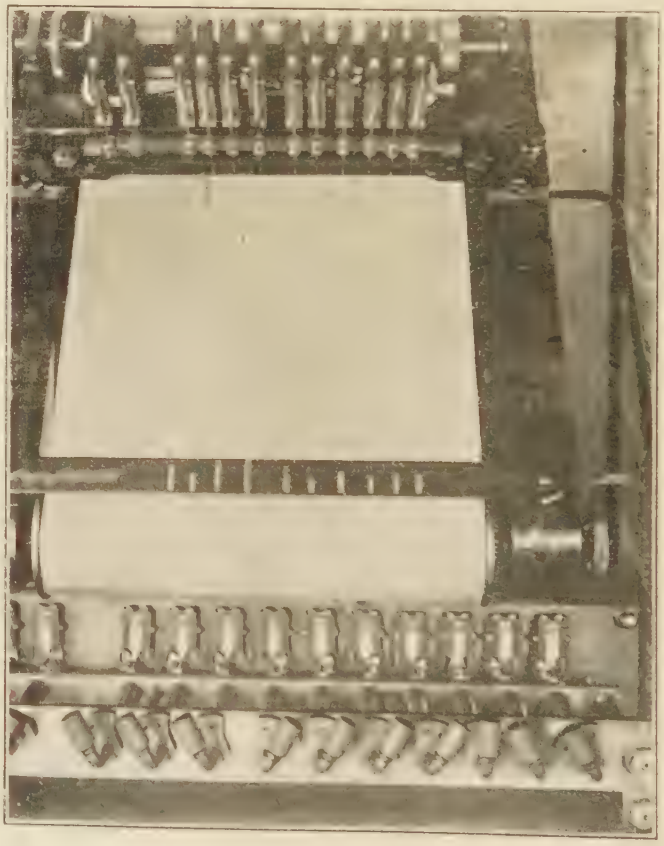
The principal of this cab signal is that if a contact rail is energized (by the closing of the dispatcher's control switch) a passing train will receive a clear signal; if the contact rail is de-energized (purposely by the dispatcher opening the control switch, or because of a line wire derangement) a passing train will receive a stop signal. A clear signal will continue to show while running through the block, and a stop signal, once displayed, will remain displayed until the car reaches an energized contact rail. For example, when two trains are to meet each motorman gets a red signal when 2000 ft. distant from the meeting point; that is, when his car passes the distant rail. This red signal remains displayed in his cab continuously until it is cleared by the dispatcher, but it cannot be cleared until the car reaches the third-rail opposite the siding. Thus the train at a meeting point which heads into the siding has a red signal displayed in the cab until after the other train has passed and until the dispatcher has given a clear signal, and this clear signal will not be received by the train on the siding until after it has backed out on the main line and moved a few feet forward so that its third-rail shoe comes in contact with the signal rail. This set of circumstances in connection with the interlocking features of the signal system provides for extreme flexibility in the handling of trains in sections at passing and meeting points.

This system is designed to do the work not only of an automatic block signal system but also of the so-called dispatcher's signal system, because the dispatcher may at any time stop any train at any siding.

TRAIN RECORD SHEET

The record sheet is directly driven through a worm ratchet movement which is operated every five seconds by a pair of magnets controlled by a carefully adjusted clock movement. The record sheet is divided into "time" lines in one direction and "block" lines in the other. The time divisions on the sheet, shown by horizontal lines, are on the scale of 6 in. to one hour, the lines being ruled at intervals corresponding to one minute of time each. The block lines are ruled perpendicularly and are spaced proportionately to the lengths of the various blocks. These block lines are continuous and the space between any two adjacent lines reprecents proportionately the distance between any two sidings. The record sheet is so arranged with regard to its moving mechanism that about two hours' performance is always visible to a dispatcher, and he can at all times see the changes that are being made in the records as they occur.

The movements of trains are recorded on the sheet by means of two separate sets of perforating needles. The function of one set is to make a single punch mark whenever the third rail is passed over by a train. The other set makes a continuous perforation whenever a train enters a



Indianapolis & Cincinnati Signal Equipment—Record Sheet in Service, Showing Records Made by Two Opposing Trains

block, and it forms a graphic record of the length of time occupied by it in passing through a block as well as a record of its time of entry and exit. The single punch needles referred to above are called the upper needles, and those that make the continuance perforations are called the bottom needles. The bottom needles are further distinguished by being divided into sets for recording east-bound and west-bound train movements respectively.

Each needle is actuated by an electromagnet and these magnets are energized through front contacts on the main relays in the dispatcher's control circuits.

The essential features of the Simmen record system are the main control line relay and the single-punching top needle. The line-cutting bottom needles are used as refinements to make the records more readable. This simple circuit with its top needles and local battery controlled by the front contacts on the main relay in the main line control would serve to give all the indications required for a complete signal system. However, additional features are added to enhance the legibility and value of the record and to incrase the flexibility of train control. The chief feature for obtaining these supplementary results is a set of magnet-operated needles which perforate the paper from below, and in contrast with the top needles which merely make a dot the bottom needles cut a line in the paper, recording the full time which a train occupies in running through a block.

The front contacts on the main control circuit relay, in addition to closing the circuit operating the top needle, also send an impulse through a set of locking coils which act on the control of the continuous needles that cut the record

Indianapolis & Cincinnati Signal Equipment—Inspection Party

lines from below the paper. These lines for any one train are always being cut in the paper so long as that train is going over the road. However, one needle cuts for only one block, and when the train leaves that block the adjacent needle begins cutting in the next section of the record sheet. Thus the time of arriving and leaving at the division point between the block is indicated as well as the time used in passing through the block.

The interlocking relays for the bottom needles also interlock the switch handles so that after the dispatcher has given to a train the rights for one block and these rights have been accepted the dispatcher cannot give right to that block to an opposing train until the first train has left the block.

The record sheet also checks the dispatcher and shows just how the switches have been set for all train movements, the location of the lines in the columns indicating whether the switch was set for east-bound or west-bound movement.

OPERATING FEATURES

The signal system has no connection at all with the car-propulsion current supply, and thus when the power goes off from the transmission line there is no reason why cars cannot coast down hill or proceed under any momentum that they may have and thus be able to save some time. All the testing work necessary in connection with obtaining high continuity of service from this signal system can be done in the dispatcher's office.

Open-switch protection may very cheaply be provided with the Simmen signal system by placing a standard switch circuit controller so that it will be operated by the movement of the switchpoint, and when the switch is set open the controller will open the line which connects the contact rails with the dispatcher's office. Thus trains would receive stop signals when 2000 ft. from an open switch.

With regard to maintenance of the signal system, it is noted that all of the pieces of apparatus are located either in the dispatcher's office or in the cab of a car, the two places on the road where they can most easily and economically be inspected.

NEW PASSENGER STATION AT PUYALLUP, WASH.

The Puget Sound Electric Railway has recently completed a new passenger and freight station at Puyallup, Wash., which is shown in the illustration. Puyallup is on the Orting division of the Puget Sound Electric Railway, 11

Passenger and Freight Station at Puyallup—Puget Sound Electric Railway

miles southeast of Tacoma. The regular service over this division includes eleven trains each way daily.

The station building is located on company property and fronts on a small park owned and maintained by the railway company. It is 41 ft. x 60 ft. in plan and of frame construction with wide overhanging roof. Space was provided for a display room and workshop for the light and power department of this company. A freight room and a sheltered unloading platform have been provided on the side of the building away from the main track and a team and house track has been constructed along this side of the building. A driveway encircles the building so as to facilitate team movements to and from the team track and freight house. A wide concrete platform extends in from the street, occupying the entire space between the front of the station and the main track.

The appropriations for the year 1912-13 for the Osaka (Japan) Municipal Electric Tramways provide for the extension of the system by about 6 miles. A large quantity of materials, to the extent of about $1,985,532, will be ordered from foreign sources. The railway items will include rails, motors, brakes and other truck apparatus, and copper wire. Bridge material is also likely to be required.

TESTS OF CAR HEATERS IN CLEVELAND

An investigation has been made by the Cleveland Railway into the merits of various systems of heating trail cars for rush-hour service. The investigation was carried on under the supervision of T. Scullin, master mechanic of the Cleveland Railway, and J. H. Alexander, chief engineer for the City Street Railroad Commissioner of Cleveland. It was witnessed by Street Railroad Commissioner Witt and by representatives of the various car heater manufacturing companies whose apparatus was concerned in the test. An abstract of the report made as the result of this investigation follows:

"Three types of heaters were tested, namely, straight electric heaters, the forced ventilation electric heater and the forced ventilation coal heater.

"The tests were made upon three of the railway company's 900-type cars, having an over-all length of 52 ft., the front vestibule being inclosed and the rear vestibule open. Each type of heater was installed in a separate car. The tests were made with the cars end to end on a track in the shops of the railway company. Two side ventilator sashes in the front of the car and two in the rear were open during the entire test. The straight electric heater system manufactured by the Consolidated Car Heating Company was installed on car No. 909 and consisted of twenty-six heaters, installed underneath car seats, one main switch cabinet, one magnetic switch, one thermostat and one snap switch. The forced ventilation electric heater manufactured by the Peter Smith Heater Company was installed on car No. 911. It consisted of a compact electric heating unit in a sheet steel housing, equipped with a Sturtevant multivane blower, size C, direct-connected to a 220-volt, 8-amp series-wound, ball-bearing motor. The cold air taken from underneath the car is blown over the heating coils and distributed from a hot-air duct extending the length of the car body. This heater in service would be installed with an interrupter and thermostat to regulate the temperature of the car automatically. The forced ventilation coal heater installed on car No. 912 was also manufactured by the Peter Smith Heater Company and is similar to the heater described above, except that the heat is generated by the direct combustion of coal, the cold air being blown over the combustion chamber.

METHOD OF TEST

"The tests were started simultaneously at 10.46 a. m. on April 14, 1912, after the cars had been standing in an unheated building for about twenty-four hours.

"The temperature within the car was taken in all cases by three suspended thermometers, one in either end of the car body about 12 in. below the headlining and one in the center of the car at about the height of the seat back. The latter temperature was considered to be representative of the temperature of the air in the portion of the car occupied by the passengers. The temperature indicated by the thermometers just under the ceiling was practically the same as that indicated by the thermometer in the center, on the car equipped with the Consolidated heaters, and about 1 deg. to 2 deg. higher on the car equipped with the forced ventilation electric heater, while on the car equipped with the coal heater one temperature was slightly higher and one slightly lower than that in the center of the car.

"The outside temperature considered in the test was that taken at about the height of the car windows. The temperature of the intake air to the forced ventilation heaters was about 2 deg. to 4 deg. lower than the temperature at the height of the car windows, while the temperature of the air about 3 ft. above the roof of the car was 2 deg. to 3 deg. higher. A five-hour continuous heat run was made on the three cars, an employee of the railway company being stationed in each car to take thermometer readings at a signal from the recorder. The first few readings were taken at intervals of two or three minutes, in order to obtain the curve of temperature rise of the car.

"The run on the car equipped with the coal heater was not successful, owing to the insufficient draft of the heater while in operation in the building, and another test was made subsequently on this car. In this test a fan was placed on the car roof, blowing the air over the top of the smokejack, which gave the draft desired.

"On this latter test more thermometers were available and they were distributed over the sides of the car to determine what effect the heat radiating from the side of the car when the car was not in motion would have upon the envelope of air close to the car body. These temperatures indicated that with the car in actual service there would be a greater radiation from the windows and a slightly greater radiation from the roof of the car.

COST OF OPERATION

"The tests run on the two electric heaters show that in order to maintain a temperature within the car 41.9 deg. Fahr. above the surrounding air it is necessary to expend about 10,900 watts, or 267 watts for each degree rise of temperature.

"The mean temperature of Cleveland for forty years for each of the winter months was obtained from the United States Weather Bureau, and the number of degrees of heating required to maintain a temperature of 55 deg. Fahr. inside the car was determined. It was also assumed that the current must be turned on the heaters a sufficient length of time to raise the temperature to 45 deg. Fahr. before the car goes into service, also that the car remains in service two hours in the morning and two hours in the evening."

In the comparison of costs of electric and coal heaters, the contract under which the Cleveland Railway purchases energy was used for determining the cost of the electric heaters. The figures follow:

Estimated Cost of Power for Electric Heater for Trail Cars on Basis of One Car per Year.

Maximum demand at car from test (500 volts)	11.00 kw
Maximum demand at d. c. bus substation (90% efficiency of distribution)	12.23 kw
Maximum demand at generator bus (89% efficiency of transmission and conversion)	13.76 kw
12.23 kw for 2¼ hours requires 8.16 kw of substation capacity, 50% overload allowed.	
Investment in substation, 8.16 × $25 = $204.00. ($25 per kw of capacity installed.)	
Fixed charges on substation equipment, $204 × 10% = $20.40. (Includes 5% interest, 2.52% amortization, 1.36% taxes = 9.88% or 10% used.)	
Investment in distributing system is $41.70 per kw of maximum demand.	
Investment in distributing system per car, $41.70 × 12.23	$510.00
Fixed charges per car per year, $510 × 10%	51.00
Maintenance of distributing system per kw of maximum demand per year	2.00
Maintenance of distributing system per car	24.46
Consolidated car heaters require 4661 kw-hr. at car or at generator bus, 4661 ÷ .80 = 5830 at $0.0038	22.15
Substation operation and maintenance, 5190 × $0.0003	1.56
Peter Smith forced draft heater required 4172 kw-hr. at car, or 4172 ÷ .80 = 5220 kw-hr. at generator bus, 5220 × $0.0038	19.80
Substation operations and maintenance, 4640 × $0.0003	1.39

Summary of Power Cost.	Consolidated Electric Heater.	Peter Smith Electric Heater.
Demand charge for power, 13.76 kw for 6 months	$82.50	$82.50
Energy charge	22.15	19.80
Substation operation and maintenance	1.56	1.39
Fixed charge on substation	20.40	20.40
Fixed charge on distributing system	51.00	51.00
Maintenance of distributing system	24.46	24.46
	$202.07	$199.55
Peter Smith Coal Heater:		
Fixed charge, .182 kw at $16.22		$2.95
Substation operation and maintenance, 148-kw-hr. at $0.0003		.04
Energy charge, 166 kw-hr. at $0.0038		.63
Total		$3.62

In building the fire in the coal heater, the following material was used: Kindling, 1.76 lb.; ash wood, 4.25 lb.; kerosene oil, 0.312 lb.; shavings, 0.004 lb.; coal, 35.29 lb.

In the general summary, each heater was charged with interest at 5 per cent, taxes at 1.36 per cent, and repairs and maintenance at 1 cent a day. Depreciation was charged at 7 per cent in the case of electric heaters and 10 per cent

in the case of coal heater. The latter was also charged with the following special costs per year:

Coal	$21.00
Fuel and labor of kindling fire thirty times	4.09
Labor of attendance	8.76
Removing and reinstalling heater each season	1.00
Transportation and storage in summer	.50
Value of space occupied by heater	11.16

The final figures showed the Peter Smith coal heater to be far more economical than either electric heater.

In regard to weight and space occupied and a general summary the report says:

"The weights of the various heaters installed complete are as follows: Consolidated, 457 lb.; Peter Smith electric, 350 lb.; Peter Smith coal heater, 544 lb.

"The cost of power for hauling the equipment for this trailer service amounts to 2.18 cents per pound per year. The Consolidated electric heating equipment is carried throughout the year, while with the Peter Smith forced ventilation heating equipments the heating duct alone is carried throughout the year, the heater being removed and stored during the summer season.

"Either of the electric heaters installed in a car would be placed under the seats, while the coal heater during six months of the year occupies the space of one seat in the car; the value of this space is chargeable against this heater. In order to obtain this value it was assumed that the standing capacity of the car is one-half as valuable as the seating capacity. Thus in this car, seating sixty passengers and providing standing room for sixty more, the value of one seat space is one-ninetieth of the value of the car space. On a basis of 38 miles per day for a trailer 156 days per year, the mileage per heating season is 5920, which at 17 cents per car mile operating cost amounts to $1006.40. Therefore $11.16 is the value of the space occupied by the coal heater during the winter season.

SUMMARY

"Each of the three types of heaters has its individual advantages. The electric heaters afford the advantage of cleanliness, convenience and ready means of obtaining automatic regulation of the car temperature. The Peter Smith electric heater has the important additional advantage of providing a forced ventilation of about 12,000 cu. ft. of fresh warm air per hour. On the Peter Smith electric heater, however, no means were provided for automatically cutting off the current of the heating unit in case of failure of the blower motor, which would probably mean a burn-out of the heating unit. Both of the electric heaters have the disadvantage of being unable to heat the car properly in extreme weather. The curves show that in zero weather it would be impossible to maintain a temperature of more than 40 deg. Fahr. inside the car. With the coal heater a rise of over 48 deg. was obtained easily with out any attempt at crowding the heater. The exceptionally high cost of power for heating the tripper cars electrically at rush-hour periods of the day for the climatic conditions existing in Cleveland renders the operation of electrical heaters extremely uneconomical if not prohibitive."

More than four and a half million trees have been planted by the Pennsylvania Railroad in the past ten years. Last year alone 515,703 trees were transferred from the company's nursery at Morrisville, Pa., to permanent places on railroad property. At the nursery the Pennsylvania has in operation 36 acres, which are kept up to practically maximum production. In 1911 483,148 forest trees were shipped from the nursery for company use, besides which 46,558 ornamental trees and shrubs were used by the various divisions. The present stock on hand at the nursery is 2,296,833, of which 2,072,166 are forest trees and 224,667 are ornamental plants. The company treated during 1911 the equivalent of 1,250,000 ties at its two treating plants and used there 4,492,000 gal. of creosote.

PURCHASE OF STOCK OF THE INTERNATIONAL TRACTION COMPANY OF BUFFALO BY A NEW HOLDING COMPANY

With the completion of the purchase of $5,000,000 of the common stock of the International Traction Company of Buffalo, that property becomes one of a group of operating public utility corporations controlled by a central holding organization. The United Gas & Electric Corporation, which has been organized under the laws of Connecticut by Bertron, Griscom & Jenks, of New York, although not securing a majority of the stock of the International Traction Company of Buffalo, has bought half of the common stock, leaving the $5,000,000 of preferred stock outstanding. This ownership of stock, of course, is large enough to dominate the property and to direct its operation in accordance with the general plan followed by the other subsidiary properties of the new holding organization. Among the properties that will be included in the control of the group are, in addition to the International system, a number of lighting and power companies, the Susquehanna Railway & Light Company, the Elmira Water, Light & Railroad Company and the Lancaster County Railway & Light Company, which controls the Conestoga Traction Company and other properties.

The sale of the large amount of common stock of the International Traction Company shows that the plan of reorganization advanced on behalf of the company last year will not be carried out. This plan, which was prepared by Bion J. Arnold and was presented before the New York Public Service Commission, Second District, was described in detail in the ELECTRIC RAILWAY JOURNAL of Oct. 21 and Nov. 4, 1911. Instead of this plan there is substituted a new arrangement, a most important feature of which is the continuation of the corporate organization of the old property, as follows: The principal lines of urban and interurban railways are owned and operated by the International Railway Company, which also owns the capital stock of several other small operating companies. The entire capital stock of the International Railway is owned by the International Traction Company. About one-half of the common stock of the International Traction Company has been owned heretofore by the Tractional Company, a New Jersey holding company. It is this stock which is understood now to have been acquired by the United Gas & Electric Corporation.

A modification was made in the plan of the committee of holders of the 4 per cent collateral trust bonds of the International Traction Company, most of which have been deposited with bankers for the last year or two while some kind of a reorganization has been pending. This modification includes provision for an issue of $60,000,000 of 5 per cent long-time bonds by the International Railway Company. Subject to the approval of the Public Service Commission, part of this issue is to be held for refunding underlying bonds of the International Railway and subsidiaries, outstanding car trust notes of the railway company and obligations incurred in the purchase of equipment and improvements and betterments of the railway company or its subsidiaries since Jan. 1, 1911. Provision is also to be made for the issue of these bonds in sufficient amount to take up $4,343,977 certificates of indebtedness of the railway company and a subsidiary and for issue at par for extensions and additional properties at not more than the actual cost.

A unique feature of the proposed new bond issue of the railway company is that provision is to be made for a sinking fund to retire by July 1, 1949, all of the existing mortgage bonds of the International Railway and its subsidiaries, amounting to $12,651,500, or such of the new bonds as shall have been issued to retire the existing bonds of the railway company and its subsidiaries. This sinking

fund is to be created by the payment by the railway company to the trustees of such sums as with interest at 4 per cent per annum compounded will be sufficient by the maturity date mentioned to provide the necessary amount. The present International Traction Company collateral trust bonds, secured by a deposit of stock of the International Railway and other securities, are to be replaced by a new issue of bonds, involving no loss in principal to the holders but a gradual strengthening of the security by the operation of the sinking fund described.

As in the past, Thomas E. Mitten will be closely associated with the management of the property.

MEETING OF THE COMMITTEE ON POWER GENERATION

A meeting of the committee on power generation was held on Monday, June 3, in New York City. At the meeting were present G. H. Kelsay, Indiana Union Traction Company, chairman, and L. P. Crecilius, Cleveland Railway; W. H. Sawyer, Ford, Bacon & Davis, and B. F. Wood, Pennsylvania Railroad, of the committee. The committee is preparing papers on four subjects, each of which is especially assigned for investigation to two of the committee members.

The first of these subjects to be discussed was that of the selection of faulty high-tension cables when connected in multiple. This had been assigned to Messrs. Sawyer and Von Phul, of the committee. It is not intended to cover the work of the lineman in determining the location of grounds or other faults in the line, but is being treated from the standpoint of the switchboard operator, who should, in case of a short-circuit in one of several cables feeding to a common point, be able to determine promptly which one of the cables is defective. A. B. Stitzer, of Ford, Bacon & Davis, at the request of the committee, presented a report covering such methods as exist at present for the prompt selection of faulty cables. The report indicated that the only existing satisfactory means for automatic selection were almost prohibitively expensive, but that should an a.c. reverse-current relay, operating on small reverse currents, be developed it would prove, when used in connection with time limit relays, an inexpensive and desirable device for the purpose. The principle of its action lies in the fact that a short-circuit in one of several multiple cables causes current to flow along the defective cable in both directions toward the fault, the flow in the outer section of the cable, or that farthest from the power house, being reversed from the normal direction. A relay located on the outer end of the cable which would operate on this reverse current will instantly isolate the outer section of the defective cable from the other cables, and if time limit relays are installed at the power house ends of the cables their delayed action will prevent them from opening during the first rush of current to the short-circuit which opens the reverse-current relay at the outer end of the line. After the reverse-current relay has opened all cables are isolated from the fault except the one containing it, so that none of the power house circuit breakers opens except the one on the defective cable. Mr. Sawyer read a number of letters from various power users explaining their methods of locating faults.

In the discussion it was decided to make the committee's report cover the different existing methods of selection, together with an explanation of the possibilities in the line of improved methods universal in application. Messrs. Sawyer and Stitzer were requested to investigate in detail the methods of manufacture and operation of the reverse-current relay.

The report on peak loads, which was assigned for preparation to Messrs. Wood and Dyer, is to be confined to the effect in the boiler room. Curves showing the relative effect on a boiler of increasing the rate of evaporation have been prepared by Mr. Wood, and information has been collected with regard to the efficiencies and repair costs which may be expected at higher rates of evaporation than have been customary in the past. The discussion indicated that the committee was unanimous in the belief that more steam could be obtained from any given boiler than was ordinarily believed advisable, and that this could be done without seriously impairing the efficiency or safety or involving excessive repairs. Rates of evaporation of 16 lb. of water per square foot of heating surface with marine boilers and 19 lb. with locomotives were cited as opposed to the customary 3 lb. for stationary plants. An extended discussion of experiences with burst tubes was brought about when the relation of high rates of evaporation to repairs was taken up. Means for the prevention of "priming" of certain types of boilers when driven hard were also covered in detail.

Messrs. Crecilius and Wolf had been assigned to prepare the paper on the subject of boiler settings, and Mr. Crecilius presented an exceedingly interesting report giving results obtained with a new composition firebrick. This report covers the universal trouble which has followed the recent tendency toward higher furnace temperatures, or that of getting a firebrick which will not collect enormous growth of clinker on the side walls of the furnace. The marked increases both in efficiency and capacity which have accompanied the use of high blast pressures have created the necessity for a brick which will not fuse or amalgamate with the iron and sulphur in the fuel at very high temperatures. The tests reported cover to date four months of operation at a 4-in.-blast pressure, but the present condition of the furnaces lined with the new brick gives evidence that the proper composition has finally been discovered, as the large clinkers usually collecting on the side walls of chain grate or retort stokers are in this case eliminated. Mr. Crecilius strongly advocates as an ideal design the archless furnace with a boiler set high above it, not only to give a large flame space, but also to increase furnace temperature by reducing the absorption of radiant heat by the boiler. In the discussion it was decided by the committee that the subject should cover in as much detail as possible the matters of material for furnace lining and the results obtained rather than the general subject of design and baffling arrangement.

The fourth paper which will be presented at the convention, that on chemical laboratory practice in the boiler room, was assigned to Messrs. Hobein and Gates, who were unfortunately prevented from attending the meeting. Mr. Kelsay read a letter from the former stating that his report would be mailed to each member of the committee for consideration, and it was decided to make comments upon it by correspondence.

At the close of the meeting a communication was read from E. O. Ackerman, president of the Engineering Association, requesting a statement from the committee upon the recent recommendation presented at the last meeting of the electrical committee of the National Fire Protection Association to the effect that circuit breakers be installed on the negative side of d.c. generators for the purpose of fire protection, the safety device to be so located that means for opening it will be actuated from the entire generator circuit. Action on this matter by the committee was postponed for an opportunity to investigate the intent of the recommendation.

Since 1894 ozone has been used on a considerable scale in Holland, Germany, Russia and France in the purification of river water. In the United States the commercial application of ozone has been along the lines of improving the quality of the air in crowded buildings. About one part of ozone in a million parts of air, or one milligram to the cubic meter of air, is the maximum desirable limit at present.

THE 1912 NEAR-SIDE CAR

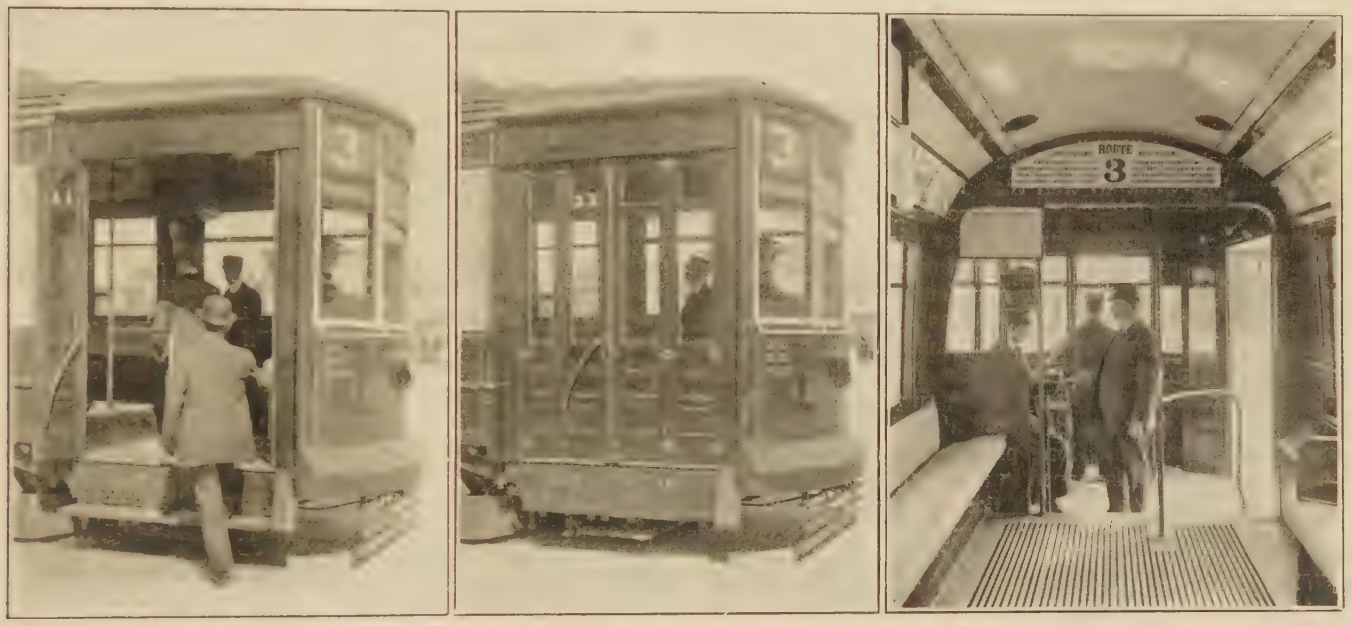
On Dec. 6, 1911, the Philadelphia Rapid Transit Company ordered from The J. G. Brill Company 800 near-side cars in addition to the fifty cars, known as the 1911 type, which had been placed in service on Sunday, Oct. 15, 1911. Although the near-side car represented a radical departure in rolling stock construction and operation, it was found unnecessary to embody any radical changes in the new cars. The alterations and additions as hereinafter described are principally along the lines of greater comfort for both the crew and the passengers.

The most important change in the construction of the car was made by sloping the car floor downward from a line directly over the front bolster to the junction of the car body and the platform and by using 33-in. diameter driving wheels. By these innovations the total height from the ground to the car floor was reduced from 39¾ in. to 36½ in. The height of the car floor above the platform was kept at 10½ in., but the height of the platform above the first step was made 13 in. instead of 14¼ in. and the height of the first step from the ground 13½ in. instead of 15 in. The ingress and egress facilities were also improved by a change in the location of grab handles and by placing a hand rail along the exit passageway, as indicated in the accompanying illustrations. The seating capacity was raised from fifty-three to fifty-four passengers. The width of the aisle was changed from 31½ in. to 30 in. so that the cross seats would be wide enough to give each passenger a seating space of approximately 17½ in. The forward aisle was covered with floor strips to prevent the tracking of moisture and dirt over the car floor, and the motorman and conductor's portion of the platform was raised to avoid dampness. To obtain full advantage of the sanitary features of the car, the crew is provided with a broom for keeping the car floor and steps clean at all times. Among other interior changes were the improved arrangement of window sash, more effective distribution of electric heaters and better illumination of the steps at the front vestibule.

In accordance with suggestions made by motormen, the seat for the motorman was placed near the center line of the front window to widen his range of vision, short curtains were provided in the front windows to protect his eyes from the glare of the sun, and a suitable fastening was installed for his watch. Among the changes made for the benefit of the conductors were the relocation of the electric light switch in the vestibule and the installation of the fare recorder directly over the conductor's head, where it is convenient to his reach when he is setting the mechanism and printing the records.

The operation of the car was bettered by using a quicker-acting hand brake, installing a simplified emergency air-brake valve over the rear door and by simplifying the operating mechanism of the rear door. The tripping gate and the apron of the wheel guard were lengthened to cover the greatest possible track width without projecting beyond the side limits of the car.

The principles which governed the company in the adoption of its comprehensive car-sign system were fully explained in the article entitled "Operation of Near-Side Cars in Philadelphia," published in the ELECTRIC RAILWAY JOURNAL of Oct. 21, 1911. Experience with the use of these signs has shown the possibility of still greater improvements. In the case of the outside signs the route number and destination were combined in one illuminated sign on the front of the car, thereby eliminating the sign over the outside step. In order to permit frequent cleaning, the route description sign on the outside side panel is now made of enameled sheet steel instead of paper. The inside route signs were transferred to the arch directly above the conductor, which makes them more conspicuous than on the narrow window panels. Special announcements are placed in the small arch at the forward end of the car, as illustrated.



Exterior and Interior Views of Platform of Near-Side Car

The length of the cars over the bumpers is 45 ft. 2 in. and over the corner posts 34 ft. 1⅜ in. The width over all at the guard rails is 8 ft. 6 in., the height from the top of the rail with the trolley pole down is 12 ft. The cars will operate over radii of 35 ft. when their truck centers are 24 ft. 6 in. apart. The operating equipment includes two Westinghouse 306-C box-type motors, one 36-K controller and one CP-27 motor-driven compressor. All the motor and air-brake circuits are in galvanized conduit.

There are in Smyrna and suburbs about 12½ miles of street railway. The most conspicuous of these is the one that runs along the quay with its one-horse cars. It is entirely owned by a French company, and the cars are made in Smyrna. The other street car lines of the town are owned by the municipality or by a Belgian company. Some of these operate two-horse cars.

EXCELLENT WEED KILLER AND TRACK BEAUTIFIER

BY R. JOHN TITZEL, ENGINEER CONESTOGA TRACTION COMPANY

The Conestoga Traction Company, of Lancaster, Pa., of which C. Edgar Titzel is general manager, has recently been using water-gas tar on its roadway to excellent advantage for the purpose of killing the weeds, settling the dust and beautifying the track. The Conestoga Traction Company has 162 miles of city and suburban track, covering practically the whole of Lancaster County.

The Lancaster Gas Light & Fuel Company, which is an allied company and is operated under the same management, makes water gas, and until last year the tar, which is a by-product, was never utilized in any way except for burning under the boilers. When used in this way it necessitates constant repairs to the boilers, so after a time it was decided best to discontinue its use as a fuel and find a better market for it.

Shortly thereafter experiments were made with it to lay dust and kill weeds. The entire works yard, in which considerable labor was required to keep the weeds down, was sprinkled with the tar, as was the street in front of the gas company's property. The tar was found to fulfil these purposes admirably. It was put on last July, and since that time not a single weed has made its appearance.

This fact was called to the attention of H. W. Crawford, engineer of the Conestoga Traction Company, and shortly thereafter a small tank and sprinkler were fitted on a truck and the work of sprinkling the track was begun. It was soon found to work so well that a tank car holding 1,000 gal. was built and preparations were made to oil the entire roadway. Shortly afterward another car was secured, so that the company now has two sprinkler cars and is prepared to carry on the work to excellent advantage.

The tar, which is stored in the gas works relief holder, is pumped from there into a small tank, and from the tank through a 2-in. line for about 600 ft. to the tank car, which is placed on the trolley siding situated on the works property. The tank car is simply a small tank about 4 ft. in diameter and 15 ft. long placed on an old truck. At one end a 2-in. hole is tapped in the bottom of the tank and connected by a 2-in. line wtih the sprinkler. A plug stop is placed in the line so that the tar can be turned on and off.

The sprinkler is a piece of 2-in. iron pipe capped at either end and just the width of a tie. It is supported by two adjustable rods which regulate the distance of the sprinkler above the rail and is attached to the outlet of the tank by a 2-in. hose. On the bottom of the pipe for use as the sprinkler are three rows of 3/16-in. holes, staggered, so that when the tar is turned on it throws a constant and uniform stream across the entire track. The part of the sprinkler directly above the rail is blanked to prevent any tar from getting on the rail. A 2-in. wire flue brush is fastened to a ⅜-in. pipe, and this is run through the sprinkler at intervals so as to clear out the leaves and other refuse which collects and tends to stop up the holes. The tank cars cost about $100 each, the tank holding 1,000 gal. being purchased for $68, and old wheels and lumber were used in the construction of the trucks.

The gas company had about 200,000 gal. of the tar in stock, so that the Conestoga Traction Company has been able to oil practically the entire roadway. The tar is sold to the Conestoga Traction Company for 2 cents per gallon just as it comes from the relief holder, and very little trouble has been experienced with water.

The tank car is pulled by a motor car, with a crew of three men, motorman, conductor and brakeman, the conductor and brakeman acting as oilers while the sprinkling is being done.

It has been found to take a little less than 3,000 gal. of tar per mile of track, the total cost of the tar as applied being about $60 to $65 per mile of track. There are a number of stretches of track on which the tar was applied last year, and this year in spite of many and heavy rains the weeds have failed to make their appearance. Much of the track is alongside the turnpikes, which are much traveled and very dusty, so it has had a very severe test. Previously it took a number of men in the summer to do nothing but pull weeds, and it was found practically impossible to keep the weeds down in this way without spending an unwarranted sum of money.

The tar, in addition to absolutely killing the weeds, is also believed to lengthen the life of the ties, although this cannot be definitely stated until more time has elapsed. The tar carries with it a slight odor of gas, but this soon disappears and is in nowise objectionable.

It is estimated that this oiling of the track will cause considerable saving in the maintenance of way and at the same time keep it in much better shape than heretofore. It is believed that one application of the tar will last two years, and that after several applications the roadbed will be so saturated that the growth of the weeds will be stopped for a considerable length of time.

There is no reason why trolley companies and gas companies cannot be mutually benefited by the use of tar for this purpose, the trolley companies securing a first-class weed killer and the gas companies a profitable market for their by-product, profitable because the tar can be sold in this way without any preparation whatever.

ANNUAL CONVENTION OF PACIFIC CLAIM AGENTS' ASSOCIATION

Abstracts of the papers presented at the fourth annual convention of the Pacific Claim Agents' Association, which was held at the Hotel Alexandria in Los Angeles, Cal., on May 21, 22 and 23, were published in the Electric Railway Journal for May 25. At the meeting the following officers were elected for the ensuing year:

President, George Carson, claim agent Puget Sound Traction, Light & Power Company, Seattle, Wash.

First vice-president, E. M. Grover, district claim agent Northern Pacific Railway, Tacoma, Wash.

Second vice-president, S. A. Bishop, claim agent Pacific Electric Railway, Los Angeles, Cal.

Third vice-president, E. H. Odell, claim agent Tacoma Railway & Power Company, Tacoma, Wash.

Secretary-treasurer, Ida P. Newel, chief clerk for claim department Portland Railway, Light & Power Company, Portland, Ore.

The executive committee is as follows: G. N. Smith, claim agent Oregon-Washington Railway & Navigation Company, Portland, Ore.; J. H. Handlon, claim agent United Railroads of San Francisco, San Francisco, Cal.; T. G. Aston, claim agent Washington Water Power Company, Spokane, Wash.; A. E. Beck, claim agent British Columbia Electric Railway, Vancouver, B. C.; W. H. Moore, claim agent San Diego Electric Railway, San Diego, Cal., and A. M. Lee, district claim agent Northern Pacific Railway, Seattle, Wash.

At this convention the Pacific Claim Agents' Index Bureau was organized and the following officers were elected:

President, B. F. Boynton, claim agent Portland Railway, Light & Power Company, Portland, Ore.

Treasurer and acting secretary, Ida P. Newel, chief clerk for claim department of the same company.

The board of directors consists of George Carson, Seattle; E. H. Odell, Tacoma; T. G. Aston, Spokane; G. N. Smith, Portland; J. H. Handlon, San Francisco, and W. H. Moore, San Diego.

The next annual meeting of this association will be held in Vancouver, B. C., on July 10, 11 and 12, 1913.

DISCUSSION ON CHICAGO TRANSPORTATION

On June 4 there were three addresses on the subject of "Passenger Subways in Chicago" in the series being conducted by the City Club of that city. Charles K. Mohler, consulting engineer, pointed out that while the total area of Chicago is 194 square miles, that of the so-called business district is only a little over ½ square mile. He mentioned some factors which were instrumental in restricting the business district to these very confined lines and said about 40 per cent of the entire traffic carried by the surface and elevated lines of the city is brought into this district. The elevated lines bring in about 21 per cent and the surface lines about 18.5 per cent. A large portion of this traffic is carried in and out during the rush hours. He said that subway lines in the downtown streets of Chicago would cost from fifty to a hundred times more than surface line tracks and from four to twelve times more than elevated lines, while for handling traffic a subway was not inherently better than an elevated line. On that account its greater cost would serve only to increase its fixed charges. He also said that only about one-fourth of Chicago's entire area was now served by rapid transit or elevated lines. He thought that the districts favored by improved transportation or the city itself should contribute toward the cost of providing adequate and cheap transportation.

Alderman Eugene Block, chairman of the City Council committee on local transportation, also made an address. He expressed himself as strongly in favor of subways, among other reasons because of their carrying capacity and elimination of grade crossings with steam railroads. He thought that the surface and elevated lines should be consolidated.

The third paper was by John Ericson, chairman of the Harbor and Subway Commission, who reviewed his proposed subway plan and gave cost data for it as compared with the cost of subways in New York and Boston.

ELECTRIFICATION OF CHICAGO TERMINALS

On June 3 Prof. W. F. M. Goss, University of Illinois, read a paper before the City Club on the electrification of steam railway terminals with special reference to Chicago He referred to the study being made by the committee of investigation on smoker abatement and electrification of railway terminals of the Chicago Association of Commerce under the direction of Horace G. Burt. Professor Goss said this committee was seeking first to determine the necessity for electrification as an important factor in this question and is making a survey of the actual atmospheric conditions of the city. The electrification of the railways would eliminate the smoke of the steam locomotives, but there are other smoke and dust-making agencies in the city. Thus, statistics show that there are 17,000 steam boilers served by nearly 10,000 stacks and, of course, many domestic fires, and the automobiles add their quota of smoke, and the wasting of their tires its quota of dirt. Professor Goss added that within the last year the railroads had cut down the amount of smoke emitted from their locomotives fully one-half and that the limit of possible improvement in this direction had not been reached. If further reductions are practical the arguments to sustain the change from steam to electricity would be weakened.

Professor Goss suggested that storage-battery locomotives, or locomotives operated by the Diesel engine, might be one solution and that the expense of such a change would be small as compared with that of general electrification. If the railroads were to be built new, the question would be different, but they were now fully equipped for steam operation, and the change to electricity would mean that all of the existing equipment would have to be abandoned except track and track structures and possibly the car bodies. At the same time there was no immediate way by which the existing revenues could be materially increased as a result of such a change. Again, in the through train service, electric operation of Chicago terminals would not materially reduce cost. There was little economy unless electric operation began with locomotive runs. The question was, therefore, largely a financial one.

There are at present about 4000 miles of steam railroad track in Chicago, requiring the use of 1673 steam locomotives apportioned as follows:

	Total Number	Per Cent
To yard service	555	33
To through passenger service	367	22
To road freight-train service	364	22
To suburban passenger service	208	12
To freight and passenger transfer service	179	11

Professor Goss suggested that instead of being forced into such an expenditure, the railroads should be encouraged to make investments in certain other directions which would be of commercial value to Chicago and at the same time return them a profit. Thus they had many miles of single track which could be changed to double track; they could install automatic block signals, and they could provide against car shortage by supplying new equipment. Not all of the forty railroads entering Chicago are prosperous. Compulsory electrification as a measure for immediate execution would add to the present embarrassment of many of them and could hardly fail to work to the ultimate disadvantage of the business interests of Chicago. In conclusion Professor Goss suggested a study of the whole problem, the power to rearrange tracks, combine stations, etc., in which plan electrification could enter.

BOSTON RAPID TRANSIT DEVELOPMENT

Another link in the rapid transit system of the Boston Elevated Railway Company was completed on June 1 by the opening of the East Cambridge extension or surface car viaduct connecting the Lechmere Square district with the North Station. The line adds another type of route to the many already in service in Boston, by establishing a surface car schedule between the Tremont Street subway and an inner suburban territory over a reinforced concrete viaduct which removes the restrictions of a highly congested area and saves an average of 7 minutes running time between many parts of Cambridge and Somerville and the heart of Boston. The engineering features of the East Cambridge extension include power supply from an overhead trolley system, automatic electric block signals of the shielded-lamp type, a rock-ballasted roadbed designed for practically noiseless double-track service, and an electrically operated vertical lift draw. There is a new station on Causeway Street, Boston, with short stairway connections leading to the North Station of the Boston & Maine Railroad and convenient transfer facilities between the viaduct cars and the elevated and tunnel train service of the city proper. On the transportation side the new line illustrates the great advantages of a private right-of-way into the heart of a large city, the convenience of a direct service and the benefits of a well co-ordinated transfer arrangement at important stations handling a varied traffic. Semi-convertible cars of the prepayment type are being operated over the new route, and these provide rolling stock units of large carrying capacity, tending to facilitate the economical handling of traffic.

At the present time preliminary construction work is under way in connection with the Boylston Street subway and an extension of the Cambridge subway under Winter and Summer Streets to the South Station, from which a further development will be carried to the Dorchester district. Rapid transit line construction has been pushed practically continuously in Boston for the past thirteen years, and the end is not yet. The work has cost and is costing colossal sums of money, upward of $120,000,000 investment having to be carried in connection with tunnel, elevated or subway lines finished or soon to be built, apart from the investment in the surface system.

STRIKE ON BOSTON ELEVATED RAILWAY

On June 1, 1912, a committee representing a union organized recently among the employees of the Boston Elevated Railway, but including in its membership only a small proportion of the men in the service of the company, asked for a conference with Gen. William A. Bancroft, president of the company. It was intended to submit to General Bancroft for his approval articles of agreement prepared by the committee to cover working conditions and wages of the men in the company's employ. This committee included several men not in the employ of the company, and General Bancroft replied on June 3 that the company "must decline to see a committee inspired by or including those not in our employ." He added that the company would, however, continue its policy of seeing its employees either individually or collectively and that the officers of the company were conferring with a committee appointed at a mass meeting at which most of its employees were present. The committee representing the union had prepared an agreement for ratification which contained seven clauses and stipulated, among other things, that all men discharged since the organization of the union should be reinstated and that wages should be readjusted.

The Boston Elevated Railway has always been very liberal and progressive in the matter of dealing with the men in its service, and at a mass meeting of 2500 of its uniformed men on May 31, 1912, loyalty was pledged to the company and the work of organizing to create "discord and dissatisfaction in the ranks" was condemned. At this meeting committees were appointed from all divisions of the company to investigate conditions among the men and to present at once to the management for adjustment any grievances found to exist in the various divisions.

On the morning following this meeting a committee of twenty loyal uniformed service men of the company appointed at the mass meeting waited upon General Bancroft to convey to him resolutions passed by the men at their mass meeting. The members of this committee stated to General Bancroft that they fully appreciated the fact that the company had earnestly endeavored at all times to treat all of its employees with the highest degree of fairness and that they very much preferred to discuss directly with the management any matters dealing with the welfare of the men.

General Bancroft, C. S. Sergeant, vice-president, and M. C. Brush, second vice-president, received the men and General Bancroft explained to them at considerable length that the company had always been glad to take up with any of its employees any matters dealing with the welfare of the men. The company considered that it had three duties to perform, namely, to render the best possible service to the public, to pay to those who had invested their money in the company a fair return upon such investment and not only to pay the men as good wages as the financial condition of the property would permit but to deal with them with the utmost fairness at all times. General Bancroft stated further that he was glad to have the men examine carefully any conditions which might now exist which affected the welfare of the employees and to take up with them details which affected the men's welfare. The members of the committee left with the understanding that they would act on General Bancroft's suggestion.

At noon on June 3 a sub-committee of six employees of the committee of twenty received previously by the officers of the company called again upon General Bancroft. The only suggestion the committee had to offer was that means should be devised to make clear to the men their position and the selfish purpose of those who were endeavoring to create discord among their fellow employees. The committee advised General Bancroft that they had established a permanent organization with permanent officers.

About a year ago the directors of the company appointed a committee consisting of the officers of the company to make a careful study of the question of hours and wages of the uniformed employees. For several years past the company has been guaranteeing to all uniformed employees, including surface motormen and conductors and elevated service motormen, guards and brakemen, $7 per week minimum pay. Effective on June 1, a change in this minimum rate of pay was made, so that in the future all men in the employ of the company or who enter the employ of the company will be guaranteed an increased minimum pay as follows: Surface motormen and conductors, $12 per week; elevated service motormen, $12 per week; elevated service guards, $11 per week; elevated service brakemen, $10 per week. This makes an increase in the guaranteed pay for surface motormen and conductors of $5 per week; elevated service motormen of $5 per week; elevated service guards of $4 per week, and elevated service brakemen of $3 per week. These increases affect solely minimum pay.

On May 23, 1912, the company issued a general order to employees in the car and train service, in which it referred to the recent act of the Legislature, Chapter 533, which act specified that on and after Jan. 1, 1913, the hours of labor for all conductors, motormen and trainmen "shall be . . . upon a basis of nine hours platform work." The company at this time stated that upon this act becoming effective next January the fact that the carmen would work nine hours instead of ten hours as at present would have no effect upon their daily wage, this being equivalent to a 10 per cent increase in the rate of pay.

At the present time the rate of pay for surface and elevated uniformed employees of the Boston Elevated Railway ranges from $2.30 per day to $2.85 per day. The company has also followed the practice for several years past of presenting to every eligible uniformed employee who has made a good record a gift of $20 or $25 in gold annually. This has been given to 80 per cent of the men and amounted last year to more than $80,000. In addition to the above rates of pay, minimum wages and gold award, the company pays to men who instruct new men an additional wage. The company pensions old employees. Indicative of the loyalty and gratitude of the men and of the generous policy of the company is the fact that there are to-day 1576 uniformed men in the service who have been in the continuous employ of the company or its predecessors ten years or more; 623 who have been with the company twenty years or more; 192 who have been with it thirty years or more, and thirty-nine who have been with the company forty years or more.

Both the Boston Elevated Mutual Aid Association and the Metropolitan Mutual Aid Association, composed of employees of the Boston Elevated Railway, have adopted resolutions expressing their appreciation of the action taken by the officials of the company in regard to the so-called nine-hour law.

The company concluded as follows a long statement addressed to the public in which it dealt with the relations of the officers of the company to its employees:

"The company is always ready to investigate, and correct, if found, any grievance of unsuitable conditions, and this fact is well known to every one of its employees. It is, therefore, not surprising that in view of its past history the management of the Boston Elevated Railway should view with disfavor the unwarranted attempts which are now being made to create discord and disaffection between the employees and the company. Such action can only result to the detriment of the employees as a body and most of all to the community which they serve. That this fact is recognized by the majority of the uniformed employees of the company was well demonstrated by the movement which they have set on foot to protest against the disturbances sought to be created by persons who, having no concern with the company, further their own interests.

"The directors and president who have in trust the administration of the company are very earnest and sincere in the performance of what they believe to be their duty, and do not recognize the necessity of any interference whatsoever with the loyal, cordial and generous relations which have existed in the past, exist in the present and *must* exist in the future between its employees and itself. The management further intends to *support* its loyal employees in their *avowed determination* that no individual or organization shall come between themselves and the officers of the company."

At a meeting on the night of June 6, 1912, of the employees of the company who had joined the union it was decided to declare a strike at once to force the company to treat with the representatives of the union. The company was handicapped somewhat in starting its early morning service, but at 8 a. m. was reported to have in service more than half of its regular morning quota of cars. Unofficial estimates give the number of men on strike as about 2000. This is considerably less than half the number of men regularly in the employ of the company.

ILLINOIS TRACTION CONSTRUCTION SCHEDULE FOR 1912

The construction schedule for 1912 on the Illinois Traction System will be largely confined to betterments on the existing property. Among the important additions to the company's business is the taking over of the lighting and power load at Cerro Gordo, Oakwood, Fithian, St. Joseph and Hopedale. These are all villages ranging from 500 to 1200 in population which are touched by this company's lines. In addition to these contracts the lighting and power load for three large coal mines will also be furnished by this company.

Among the important pieces of track construction work are the following: Extension of all important passing tracks so as to accommodate longer trains, a new substation and depot at Bondville, new Springfield terminal track layout, commercial track and coal yards at Peoria; also a connection with the Chicago, Rock Island & Pacific Railroad at Peoria, two track scales to be installed, one at the Decatur storehouse and one on the Springfield Belt, and a track connection with the Chicago, Wilmington & Vermilion County Coal Company at Thayer.

Thirty-four sets of 700-volt d.c. electrolytic lightning arresters will be purchased and installed at the various substations along this company's lines, and six sets of electrolytic lightning arresters for 33,000 volts a.c. will be installed at substations which have not been equipped with this type of protection on the a.c. side.

INTERNATIONAL ELECTRICAL CONGRESS

The officers for the International Electrical Congress, to be held in San Francisco during the World's Fair in that city, have been announced. The committee of organization consists of Charles P. Steinmetz, president; Arthur E. Kennelly, vice-president on program; C. O. Mailloux, vice-president on international relations; W. D. Weaver, vice-president on organization; Henry A. Lardner, vice-president on Pacific Coast relations; Edward B. Rosa, secretary, and Preston S. Millar, treasurer and business manager. These officers constitute the executive committee and were appointed by President Dunn of the American Institute of Electrical Engineers.

In addition, President Dunn has appointed a number of other Institute members, who are also members of other national bodies, to co-operate with the executive committee in the work of the congress. Among the associations so represented are the American Electric Railway Association, American Electrochemical Society, Association of Edison Illuminating Companies, Association of Railway Electrical Engineers, Canadian Electrical Association, Empire State Gas & Electric Association, Franklin Institute, Illuminating Engineering Society, National Bureau of Standards, National Electric Light Association, and Society for the Promotion of Engineering Education. In addition the committee of organization includes a number of members appointed from the Pacific Coast and fifty-six members at large.

ENSUS REPORT ON ELECTRIC CARS MANUFACTURED AND REPAIR SHOPS

In the thirteenth census, or that for 1910, the Department of Commerce and Labor has compiled statistics on the manufacture of electric railway cars and statistics of electric railway repair shops. These figures are for the calendar year 1909, and in the accompanying tables they are compared with similar statistics compiled for the calendar year 1904. The statistics on the manufacture of electric cars do not include cars made in the shops of railway companies or by concerns primarily engaged in making steam railroad cars, but do include the manufacture of a certain number of steam railroad freight cars in shops which were otherwise devoted entirely to the manufacture of passenger cars.

STATISTICS OF CARS BUILT BY CAR BUILDERS.

Product.	1909.	1904.
Electric railroad cars, number	1,922	3,966
Value	$4,602,435	$8,302,512
Closed, number	1,323	2,621
Value	$3,500,781	$5,777,257
Combination, number	369	502
Value	$704,309	$1,240,864
Open, number	95	554
Value	$141,008	$860,349
Freight, express and mail, number	92	16
Value	$179,293	$24,022
Other varieties, number	43	[4]273
Value	$77,044	$400,020
Steam railroad cars, freight service, all classes, number	167	136
Value	$111,813	$59,663
All other products, value	$3,095,618	$2,482,021
Total value	[2]$7,809,866	[3]$10,844,196

[1]Products were not shown in detail for 1899; the total value was $7,305,368.
[2]In addition, 607 cars, valued at $2,033,922, were made by establishments engaged primarily in the manufacture of products other than those covered by the industry designation.
[3]In addition, 418 cars, valued at $994,654, were made by establishments engaged primarily in the manufacture of products other than those covered by the industry designation.
[4]Includes thirty-eight horse cars, valued at $29,182.

The following statistics relate to work undertaken in construction in the repair shops of street railroad companies. The work done, which consists almost wholly of repairs, was not reported in detail in 1899, but its aggregate value in that year was $9,370,811, as compared with $13,437,121 in 1904 and $31,962,561 in 1909, an increase for the decade of 241.1 per cent.

STATISTICS OF ELECTRIC RAILWAY REPAIR SHOPS.

Class of Work.	1909.	1904
Motive power and machinery department, value	$4,510,332	$510,946
Repairs to motors, etc	$4,004,336	.....
Work for other corporations	$88,070	$2,626
All other products or work	[1]$417,926	$508,320
Car department, value	$25,835,463	$12,581,365
Cars built, value	$626,752	$605,144
Passenger, number	129	288
Value	$498,709	$580,669
Freight, number	63	13
Value	$59,102	$11,366
Other, number	51	9
Value	$68,941	$13,109
Repairs to cars of all kinds	$22,869,777	$11,254,505
Work for other corporations	$624,805	$36,714
All other products or work	$1,714,129	$685,002
Bridge and building department (shopwork), value	$330,948	$327,855
Repairs and renewals	$273,581	$253,133
Work for other corporations	$5,093	.....
All other products or work	$52,274	$74,722
All other products and work not classified, value	$1,285,818	$16,955
Total value	$31,962,561	$13,437,121

[1]Includes value of three electric locomotives.

COMMUNICATIONS

BROKEN COMMUTATOR LEADS

May 28, 1912.

To the Editors:

We operate about 40 miles of interurban road and try to keep up everything in first-class shape but have a great deal of trouble with armature leads breaking off. We have found that some of our armature cores were loose, and this no doubt caused some of the trouble, but we have considerable trouble even with armatures that are almost new and in cases in which we are positive that the commutators and the laminations are tight on the shaft. We have been exceedingly careful in placing the leads in the commutator slots not to hammer or bend them too short back of the commutator, but still have more trouble than we should. We might add that we use a very soft copper wire. Our equipment consists of Westinghouse No. 56 and No. 76 motors and is operated from both ends of the car.

We should appreciate it very much if you would give us an idea as to what is causing the trouble.

SUBSCRIBER.

The most common causes of broken armature leads are loose laminations and loose commutators. In the two types of armatures which you mention the laminations are mounted directly on the shaft and are much more liable to become loose than on a type of armature with spider construction with laminations mounted on it. If the commutator and laminations are tight, the cause of the trouble is probably in the material or method employed in rewinding armatures. When coils are being prepared and placed in the slots the leads are often bent back and forth a number of times, sometimes unnecessarily. Thus, when the corners and ends of the coil are being taped the operator will often bend the leads back to make a neat job of the taping. Then the person who winds the armature is apt to bend the leads back again to get them out of the way while he is bringing other leads down to the commutator. This may start a fracture, which is soon increased in size by the vibration of service conditions. When the repair man is bringing the leads down to the commutator he should be careful to avoid sharp bends. They may make a neater appearing armature, but wearing qualities should never be sacrificed to secure a good appearance. If the operating conditions are such as to produce severe vibrations in the motor parts, it may be of advantage to provide a support for the leads between the end of the armature and the commutator. One method that has given good results on other roads is to fill this space with a mixture of powdered asbestos and shellac, after all leads are in place. This material can be forced in between the leads by the use of a tube fitted with a plunger and having one end drawn out small enough to enter between the leads. All armature coils should be tight in the slots. The repair man should also make certain that the wedges are of sufficient thickness so that the bands will come down tight on them and not be resting on the laminations with a space between the bands and the wedges.

One large road which had a great number of broken armature leads has almost entirely done away with trouble of this nature by shortening the distance that the leads are unsupported. Previous to the change the leads left the coils at the corners and had no support till the commutator was reached. The change consisted of bending the leads farther around on the end of the coil and taping them in so as to shorten the distance to the commutator considerably. On armatures with leads going in opposite directions this cannot be followed to any great extent, but leads going in the same direction can be taped together so as to form a support for each other and make a more rigid construction.

SPARKING AT COMMUTATORS

KINGSTON, PORTSMOUTH & CATARAQUI ELECTRIC RAILWAY
KINGSTON, ONT., May 31, 1912.

To the Editors:

We have tried the remedy of slotting the commutator for brush sparking, as described in your issue of May 25, and found that the trouble continued, but not nearly to the same extent as before. The carhouse foreman then moved the brush holder one bar against the rotation in some cases, in others as much as three bars, and the trouble has been entirely overcome. In fact, one car with a slotted commutator and the brush holder moved against the rotation has run about 7000 miles, the wear on the commutator cannot be felt, and the soft brushes we are using have worn down about 1/32 in.

I desire to thank you very heartily for your article, as it gives other causes for commutator arcing.

HUGH C. NICKLE, General Superintendent.

RAILWAY SIGNAL VOLT-AMMETER

For testing signal circuits in the field a portable instrument of the smallest size consistent with accurate readings and rugged construction should be provided. It is also usually essential that such an instrument should be provided with several voltmeter and ammeter scales, because of the various values of current and potential to be measured. Such an instrument is the new type "S-2," which has been developed by the General Electric Company's signal accessory department especially for railway signal work and is illustrated herewith.

Railway Signal Volt-Ammeter

Three voltmeter and three ammeter ranges are provided for each instrument, or a total of six. Thus one meter reads 150 volts, 15 volts and 1.5 volts and 15 amp, 1.5 amp and 150 milliamp for full scale values. Another reads 150 volts, 30 volts and 3 volts and 15 amp, 3 amp and 300 milliamp. Change is made from one range to another by a button switch on the front of the instrument and without any change of connections at all.

The new type S-2 instrument is pocket size, in a heavy mahogany case. Ammeter readings can be taken on any of the ranges without opening the circuit, so that clearing and hold-clear current for a signal can be accurately read.

The design is based on the D'Arsonval principle. The instrument is specially designed for hard usage, being an adaptation of the automobile type, with very light moving element. It is accurate in all ranges and practically "dead-beat."

As a result of the arbitration proceedings which have been carried on between the London County Council and the London United Tramways, with regard to the acquisition of that part of the company's undertaking within the jurisdiction of the London County Council, it has been agreed that the latter authority shall acquire the large generating station at Chiswick, and the price agreed upon is said to be about $1,100,000. The tramway company already receives part of its current from the power station at Lot's Road, Chelsea, and after the proposed transfer has been effected the whole of the current will be obtained from Lot's Road. The Chiswick power station was built by the late Sir Clifton Robinson.

A METHOD FOR REPAIRING LIVE-WIRE HIGH-TENSION LINES

Since the railway companies operating high-tension lines have taken up the sales of current for light and power, the question of shutting the current off from the distributing lines in order to make necessary repairs and replacements has become a very important one. Discontinuance of service, even at night, is impossible, and it has become necessary to devise some way of making repairs without disturbing the service. A method of doing this work has been devised and patented by Jerry Cronin, superintendent of lines for the Western Ohio Railroad, which operates transmission lines at 33,000 volts. Up to date fifty cases of trouble on these lines have been corrected and replacements made by this method without disturbing the service in any way.

The apparatus devised by Mr. Cronin for this purpose is a very simple one and consists of what is called a "strong man," made in the shape of a letter "T" with adjustable arms capable of being extended in both directions. The simplest form of three-phase construction, or the single arm with a ridge pin on the top of the pole, is taken care of by the "strong man" being attached to the pole, the wires to be moved being engaged in cages on the insulators of the "strong man." The wires are then untied with a thoroughly insulated tool from the insulators on the pole. After this has been done the "strong man" has its arms extended by means of pulleys and, at the same time, a part of it is raised until the wires are supported at sufficient distance above and away from the pole to allow the men to work in perfect safety.

The changing of cross-arms or insulators then becomes a perfectly simple proposition and can be done as readily as when the lines are dead. The change of one line or the removal of one insulator is done with a holding device which is mounted on an insulated pole and manipulated by two men who simply push the wire away from the insulator, allowing the lineman to manipulate a special tool which grips the insulator and unscrews it from the pin. Replacement of insulators is done by a reversal of this procedure. The patents include the tie wire and the method of tying the wire to the insulator after replacements have been made. This is done very simply by using the hook and fork on the insulated tool in loops which are made in the ends of the tie wires. It is even stated that a better tie is left than can be made with the ordinary methods on a dead line. It has been found very easy to replace a pole by setting a new pole alongside the broken or damaged one and then putting the wires in place. In fact, all ordinary repairs have been found to be quite simple.

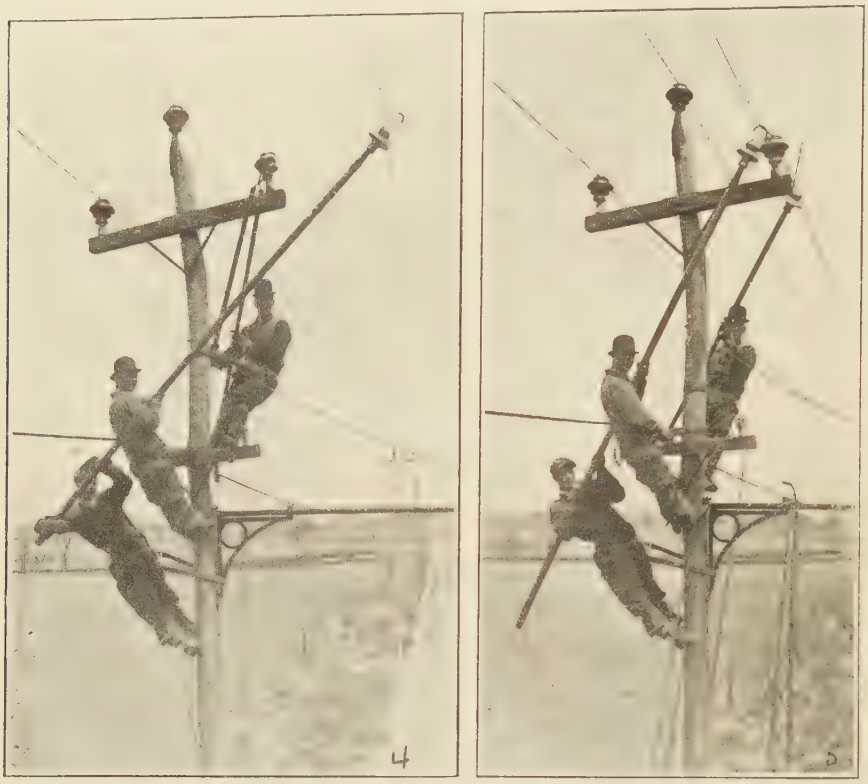
The major operations involved in making repairs to a simple three-phase transmission line are shown in the accompanying half-tones, of which one covers the replacement of a cross-arm with the consequent removal of all three wires, and the other the replacement of a damaged insulator in a single wire. In the former illustration the first view shows the "strong man" in place with the phase wires held on its insulators by the cages, while the phase wires are being untied from the old insulators. The second view shows the wires raised clear of the pole by the "strong man" and the old cross-arm and insulators removed. The third view shows the operation practically completed, the new cross-arm and insulators being in place while the "strong man" has been disengaged from the wires and is ready for lowering to the ground. In the two other views the one numbered four shows one of the wires being held in the clear by means of an insulated cage on a long handle while a broken insulator is being unscrewed from its pin with a long-handled gripping device. The view numbered five shows the phase wire being held in place on the new insulator while the line man is using another insulated tool to bind it with the looped tie wire.

Views Showing Method of Using "Strong Man" to Permit Removal of Cross Arm

The Western Ohio Railroad Company has in several cases changed a cross-arm complete in thirty-two minutes, and many insulators have been changed in thirteen minutes. Recently a demonstration was given near the power house of the Indiana Union Traction Company at Anderson, Ind., in the presence of officials of the Indiana Union Traction Company, the Terre Haute, Indianapolis & Eastern Trac-

tion Company and several other interested parties, during which a double circuit of six wires was removed from the insulators, new cross-arms and insulators installed and the wires re-tied on the new insulators.

The Cronin Electrical Appliances Company, of Wapakoneta, Ohio, which manufactures the apparatus, is now constructing field outfits for use on the Aurora, Elgin & Chicago Railroad Company and the Cleveland, Southwestern & Columbus Traction Company, which have sent representatives to witness demonstrations and declared themselves well satisfied with the operation.



Views Showing Method of Removing Single Insulator

The Western Ohio Railroad Company is giving this device unqualified praise, as it has already saved considerable money in wages and time, as well as costly shut-downs.

STRENGTHENING A SMALL WHEEL HUB

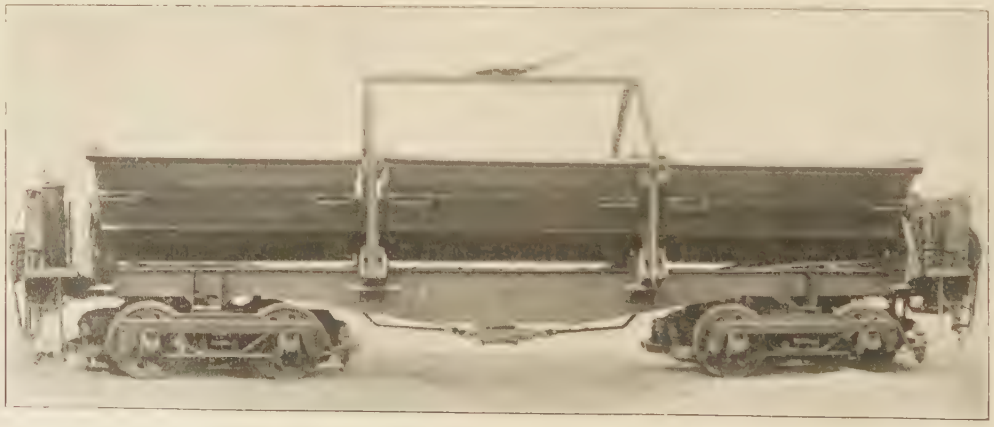
By preheating with molten metal a correspondent of London *Engineering* states that he was able to "burn on" sufficient cast metal to double the size of hubs on a number of old wheels without showing any parting line between the old and the new metal. This was done by forming around the old wheel hub a mold of sand having a large inlet at the top and a smaller outlet at the bottom. As molten iron was poured into the mold a considerable portion escaped from the outlet, delaying the operation of filling and raising the temperature of the contents of the mold. The wheel upon which the work was done was 24 in. in diameter with a spoked center. It was made of wrought iron and the added material was obtained from a foundry cupola mixture containing 40 per cent of British pig iron and 60 per cent of mild steel scrap. The molten material which escaped from the outlet hole in the mold was run into another mold which required about a ton of steel to fill, so that there was no waste of hot metal. A timing of the filling process showed that the hub was in contact with a constantly changing supply of hot fluid steel for about fifty seconds. The boss when cut showed no sign of a joint.

A SIDE-DUMPING MATERIAL CAR

The Orenstein-Arthur Koppel Company has just built for the British Columbia Electric Company, Vancouver, one of its new side-dumping cars for handling bulk material. This car is designed not only for transporting sand and gravel in construction work and track maintenance, but also for the collection of garbage, street sweepings or waste materials after the street has been repaired or paved.

The most important feature of the car is the method of unloading. Each one of the three trough-shaped sections which form the car body is dumped by rolling it over sidewise, and the material contained in it is thrown clear of the rail on either side of the car desired, permitting the car to move on at once after dumping without causing delay to traffic.

The car is provided with three bodies which are independent of each other and permit the car to be used in carrying three different kinds of material at the same time. It also permits them to dump part of the load to one side of the track and part to the other, or to distribute the load at different points along the track. Each body, as shown in the illustration, consists of a V-shaped bucket provided with cast-steel cradles at each end which rest on suitable supports on the car underframe. The shape of these cradles is such that the bodies roll over to the side when being dumped, distributing the load out beyond the track rails. The bodies are held in an upright position by a patented automatic lock. These locks are so arranged that when it is desired to dump a car a man standing on the side opposite to the side on which it is desired to dump can release the locks and with a slight push roll the body over and dump the contents. The body can be promptly returned to the upright position with very little effort. When the body returns to the upright position the locks engage automatically so that the body will not roll over to the opposite side.

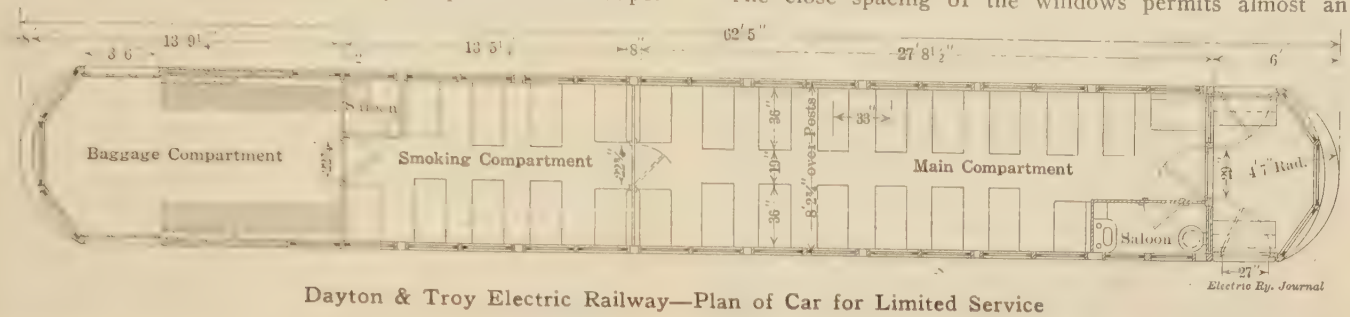


Side View of Car Showing Three-Part Body

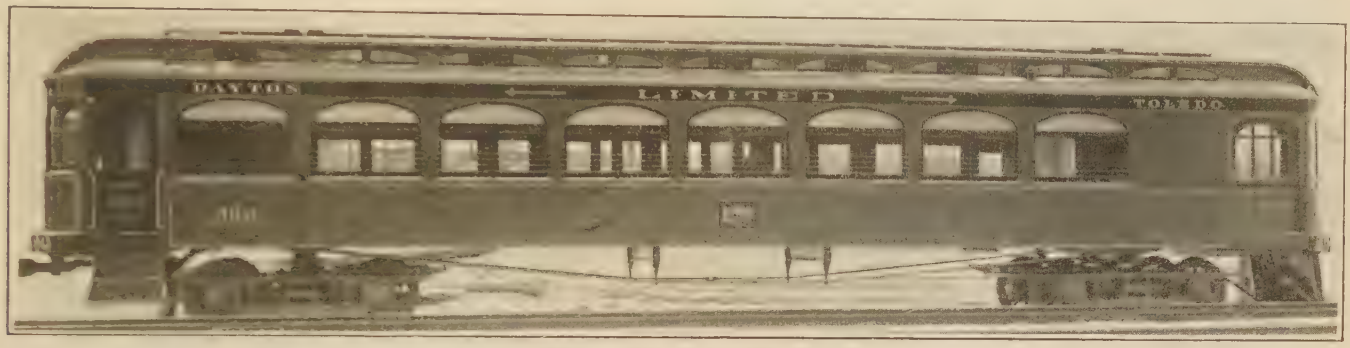
THE DAYTON & TROY RAILWAY COMPANY'S OFFICE CAR AND CARS FOR LIMITED SERVICE BETWEEN DAYTON AND TOLEDO

The Dayton & Troy Electric Railway has lately remodeled a trail car for use both as an office car and as a conveyance for inspection and pleasure parties. The work was done at the Tippecanoe City shops under the supervision of R. A. Crume, treasurer, general manager and purchasing agent of this company.

The general appearance of the car may be noted in the illustrations. The car body is approximately 50 ft. over all. It is provided with an observation end and two large compartments, one of which will be used as a dining room and office and the other as a parlor and observation compartment. The front platform and a portion of the car body have been utilized for a toilet room on one side and a kitchenette on the other, both of which have white enamel and nickeled fixtures. The kitchenette, although small, is complete in every detail, being provided with cupboards, electric stove, ice box and sink. The dining compartment is made very attractive by its finish in early English oak and by its leather-upholstered "Mission" style furniture. The floor is laid in quartered oak, which is paneled to relieve the monotony of straight lines.



Dayton & Troy Electric Railway—Plan of Car for Limited Service



Dayton & Troy Electric Railway—Car for Limited Service

The parlor compartment is finished in mahogany and furnished with willow chairs upholstered with green-tinted leather. A large built-in couch, upholstered in leather of the same color, has been placed along the partition between the two compartments. The result of this combination of colors and finish is very pleasing. To add to the general richness, plain, dark-green runners have been provided throughout the two compartments.

The close spacing of the windows permits almost an uninterrupted view from any point in the car. The bulkhead at the observation end has been constructed with large plate-glass windows extending nearly the full height. The artificial illumination is obtained from two light brackets located at the tops of the mullions between every set of windows, and handsome four-light fixtures have been installed in the ceiling in each compartment. The car is heated by a Peter Smith hot-air heater in the front end opposite the kitchenette and has ten roof ventilators.

The office car will be operated only as a trailer, as no provision has been made for equipping it with motors. It has automatic air and M. C. B. standard automatic couplers. This car has been named "Muriel," in honor of Muriel S. Crume, the general manager's wife.

Dayton & Troy Electric Railway—Parlor and Office Car Made from Trailer

NEW CARS FOR LIMITED SERVICE BETWEEN DAYTON AND TOLEDO

The company has recently received two new cars from the Jewett Car Company, which will be put in the through

limited train service operated by this railway between Dayton and Toledo via its lines to Lima, the Western Ohio Railway and the Toledo, Bowling Green & Southern Traction companies' lines to Toledo. Each car body is 62 ft.

Dayton & Troy Electric Railway—Parlor Section of Private Car

5 in. over the bumpers and 8 ft. 2¾ in. wide. It was built for single-end operation, and is divided into three compartments, which include a main compartment 27 ft. 8½ in. long, a smoking compartment 13 ft. 5¼ ft. long and a com-

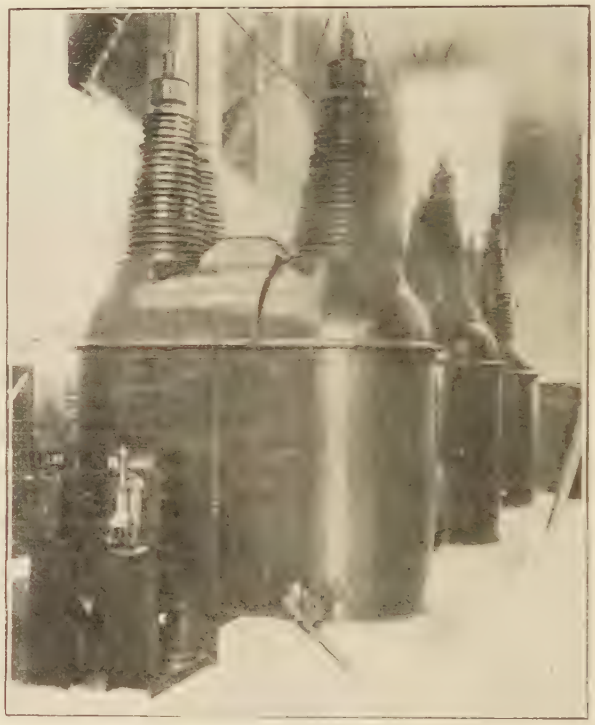
Dayton & Troy Electric Railway—Office Section of Private Car

bined baggage compartment and motorman's cab 13 ft. 9¼ in. long. Toilet facilities for women are at the rear of the main compartment and for men at the front of the smoking compartment.

The seats are spaced 33-in. centers and are 36 in. long, which leaves a 19-in. aisle. The inside finish in the passenger compartments is mahogany striped with inlaid white holly. The baggage compartment has two folding seats. Ventilation is obtained through Garland deck sash ventilators. Tungsten lamps are used for the car lighting. The motive equipment consists of Westinghouse 112-B type motors mounted on American Locomotive type trucks, L-4 type Westinghouse control and M. C. B. standard straight and automatic air brakes.

HIGH-TENSION OIL SWITCHES

The accompanying illustration shows one of the oil switches which the General Electric Company has built for the 140,000-volt line of the Eastern Michigan Power Company, the highest voltage line in commercial operation. These oil switches passed the high-potential test of 465,000 volts. In general they are similar to the 110,000-volt General Electric type "F," form "K-10" tank-type switches, but since it would be impossible to close switches of this size by hand with the ordinary operating mechanism, a tandem



140,000-Volt Oil Switch in Eastern Michigan Substation

mechanism in which the operating handle moves through an angle of 180 deg. was developed for this purpose. Some of the switches are automatic while others are non-automatic. The automatic switches are opened on overload by a series trip, which acts directly on the locking latch.

Each switch consists of three single-pole elements, one in each phase, and in each element there is a double break of sufficient length for more than 140,000 volts. The insulating bushings consist essentially of an entrance conductor surrounded by a semi-fluid compound which is contained in an insulating shell. The shell is built up of porcelain end-pieces, a series of alternate non-carbonizing rings and treated barriers. The compound contains a number of insulating cylinders which are concentric with the conductor. The non-carbonizing rings and insulating compound have great dielectric strength. The barriers between the rings are of large diameter and resist static surface discharge, thereby increasing the arc-over voltage. The concentric cylinders in the compound distribute potential strains on the interior of the bushing and increase the rupturing strength.

News of Electric Railways

Plans for Shop Improvements in Detroit

When the plans of the Detroit (Mich.) United Railway are complete it is said that its property in Highland Park, which consists of 20 acres of land, will contain the usual repair shops and other buildings used in connection with them and facilities for manufacturing cars. The company intends to move the machine and repair shops from Monroe Avenue to Highland Park and to enlarge and extend them to meet the needs of the company.

The property is located on the west side of Woodward Avenue and extends to Hamilton Avenue. The property which faces on Woodward Avenue is occupied by an office building and power plant. The new carhouses of the Woodward Avenue line will be in the rear. The proposed new buildings, which are to be erected at intervals, will form a group of four structures, two on either side of Third Avenue, with space in the rear for extensions. Smith, Hinchman & Grylis, architects, are preparing plans for a new paint shop, the first of the four buildings to be erected. It will have a frontage of 289 ft. on the east side of Third Avenue and a depth of 208 ft. A portion of the building will be two stories high and the remainder will be one story high. This building will be of reinforced concrete and steel construction, with steel window sash and fireproof roof. The roof over the paint shop proper and the washroom will be of reinforced concrete with saw-tooth construction. The washroom will be 23 ft. by 289 ft. and the paint shop will be 132 ft. by 289 ft. ground dimensions. The latter will have seven tracks with a capacity of about thirty-five cars. A glazing room, striping room and washroom and lockers for employees will be located on this floor. The second floor will contain a lunch room for the men, a sign room, scraper room and varnish room. Two elevators will be provided to take materials from one floor to the other. The building will be equipped with a sprinkler system. The total cost of the structure will be about $125,000.

The space north of this building will be reserved for a stock and foundry building. Opposite the latter, on the west side of Third Avenue, a truck shop will eventually be located. Space for a carpenter and machine shop will be reserved just south of the truck shop. The power plant for the operation of the shops will be located on the west side of Third Avenue, between these two buildings.

Suit to Have Corporation Tax Refunded.

The Cincinnati (Ohio) Street Railway, lessor of the Cincinnati street railway system, has filed suit in the United States District Court at Cincinnati against Bernhard Bettmann, United States collector of internal revenue for the Cincinnati district, to recover $22,260.98, with interest, alleged to have been unjustly and illegally assessed by the United States commissioner of internal revenue and collected by Collector Bettmann as an excise tax under the federal corporation income tax law, passed by Congress on Aug. 5, 1909. In its petition the company sets out that on Feb. 21, 1901, it leased its lines to the Cincinnati Traction Company and since that time its property has been operated by the latter company and that it has not been engaged in carrying on business. It is averred that all of the revenue and profit from the operation of the street railway system and property has been received by the Cincinnati Traction Company for its own use and benefit and that the latter company has paid the special excise tax imposed by the federal law upon the net income derived from the operation of the property. According to the petition, all the income received by the plaintiff since the leasing of the property has consisted of moneys received from the Cincinnati Traction Company as rental under the lease, and these sums, it is said, have been at once paid out and distributed as a dividend to the stockholders of the plaintiff company in proportion to their respective holdings of its stock. Because of these facts the plaintiff avers there exists no warrant in law for the assessment of a special tax against it, or for its collection by the defendant, it being alleged that there is no statute or law of the United States imposing such a tax upon it.

Six other electric railways in Ohio have filed suits at Cincinnati to recover excise taxes paid to the government under protest, their properties being leased to other companies and the taxes on the net income from the properties having been paid by the operating companies. These companies are the Cincinnati & Hamilton Traction Company, the Cincinnati, Dayton & Toledo Traction Company, the Indiana, Columbus & Eastern Traction Company, the Fort Wayne, Van West & Lima Traction Company, the Columbus, Newark & Zanesville Electric Railway and the Lima Electric Railway & Light Company.

Details of Improvements in Albany

In reply to an order of the Public Service Commission of the Second District of New York, dated May 1, 1912, the United Traction Company, Albany, N. Y., has filed a statement with the commission, in part as follows, in regard to improvements, general repairs, changes in routing, service and facilities, etc., which it intends to make during 1912:

"Equipment.—Touching up forty 500-type cars (this summer), at $20 each, $800; touching up twelve steel cars (this summer), at $20 each, $240; touching up sixty-four box cars, overhauled since Jan. 1, 1911 (this summer), at $20 each, $1,280; complete overhauling of 113 box cars (during the year), at $150 each, $16,950; rebuilding twenty small cars and providing new trucks and motors (to be completed about Oct. 1, 1912), at $3,500 each, $70,000; overhauling 155 open cars (this winter), at $75 each, $11,625; total, $100,895.

"Power.—(Before Nov. 1, 1912.)—One new 600-kw rotary converter, $4,500; three 200-kw transformers, with reactance coils, $3,500; switches, switchboard instruments, switchboard current transformers, etc., $1,100; wire, $400; labor, $500; total, $10,000.

"System.—Fifteen miles of trolley wire, $6,000; rebuilding rails, $5,000; general additional lightning arresters, $1,200; total, $14,200 (the above work is now being carried out).

"Rensselaer.—Submarine and rearrangement of overhead feeders, $13,000 (the above is about 75 per cent completed.

"Troy.—Rearrangement of feeder system (September), $25,000; submarine cable around Congress Street draw (complete), $4,000; total, $29,000.

"Albany.—Underground on Broadway (June 1), $12,000; ornamental poles on State Street (June), $2,500; additional ground return to North Albany (July), $500; additional feeder to West Albany (July), $200; additional feeder to Country Club (July), $200; total, $15,400.

"(Other distribution expenses are contained in the track department estimates.)

"Albany.—Renewing pavement and track on Broadway (June 1), $18,203.95; renewing pavement and track on Central Avenue (July), $49,000; renewing pavement and track on Washington Avenue (August), $30,000; renewing pavement on Columbia Street, Rensselaer (during summer), $2,000; special work (during summer), $10,000; rail grinder, etc., $4,770; total, $113,973.96.

"Troy, Cohoes and Green Island.—Oakwood Avenue, Troy, improvement (during summer), $500; Oakwood Avenue, Troy, pavement (during summer), $1,000; Burden Avenue, Troy, change of alignment (during summer), $5,000; special work (during summer), $16,000; total, $22,500; grand total, $136,473.96."

Governor Foss Insists on Progress

Eugene N. Foss, Governor of Massachusetts, has addressed a special message, in part as follows, to the Legislature, urging that body to carry out the recommendations made previously by him for the creation of a public service commission and for a comprehensive plan of railroad terminal improvements in Boston, and compulsory electrification of the railroads which enter that city:

"I take this occasion to appeal again to this Legislature to co-operate with me in a constructive program for the

immediate settlement of our transportation problems. I am convinced that the public demands:

"1. A stronger control and regulation by the State of the public service companies, such as can be exercised only through a powerfully constituted public service commission.

"2. The connection of our two principal railroad terminals by means of a tunnel through Boston, and that this work should be accomplished by public ownership.

"Real regulation can only be obtained by the establishment of a public service commission of the modern type with mandatory powers over rates and service. Such a commission now exists in every progressive state in the Union, while Massachusetts still suffers from the inadequate facilities and inveterate abuses of the old régime.

"What the people of the State demand is the immediate development of their transportation systems along the most advanced lines. This means, in the first place, the immediate construction by the public authorities of a tunnel system connecting South Boston, Charlestown and East Boston, open to all railroads which enter Boston, and, as a part of this general plan, the compulsory electrification of all lines which enter the city.

"I stand ready to co-operate with any committee to which action upon this message may be referred, by submitting for its consideration a draft of a comprehensive measure for state action of the sort I have outlined. I feel strongly that the time has come for two positive steps, first for the State to take control of the situation by public construction of at least the tunnels themselves as the essential parts of the terminal system, and second, for the ordering of the railroads to electrify their lines at once, so as to be ready to use these public terminals. So imperative is the necessity for having these expenditures made at once that I believe that this is one of the rare cases for public construction.

"The city or the State is fully equipped, through the Transit Commission, to proceed with the construction of these connecting tunnels as soon as you authorize it. The terms for their use can be made such that they will be burdensome neither to the public nor to the railroads, and provision should be made that all railroads now entering Boston or hereafter entering it should use this tunnel system in common under the immediate supervision of the service commission."

On May 31, 1912, Governor Foss signed the bill authorizing the Boston & Providence Railroad to issue $8,000,000 in bonds to provide funds to electrify its main line, eliminate grade crossings and install additional tracks. The New York, New Haven & Hartford Railroad, the lessee of the Boston & Providence Railroad, will guarantee the interest on the bonds.

Route Laid Out for Extension of Seventh Avenue Subway to Brooklyn

The Public Service Commission for the First District of New York has laid out the rapid transit route for the extension of the new Seventh Avenue subway, to be operated by the Interborough Rapid Transit Company, to Brooklyn. The new route will leave the proposed Seventh Avenue subway in West Broadway at Murray Street, will curve into Park Place and run through Park Place to and under Broadway and then under the Post Office Building to Beekman Street, through Beekman Street to William Street, through William Street to Old Slip, through Old Slip to and under the East River to Clark Street, Brooklyn, through Clark Street to Fulton Street, and through Fulton Street to a junction with the existing subway at or near Borough Hall. This completes the laying out of routes for the Interborough Company's part of the proposed dual system, with the exception of a short link in Lexington Avenue which provides for the junction of the existing subway with the Lexington Avenue subway. The point of junction has not yet been agreed upon, but it will be in Lexington Avenue somewhere between Thirty-second and Forty-second Streets. The only other route for the dual system which remains to be laid out is the proposed tunnel line to Staten Island, which will be connected with the Fourth Avenue subway in Brooklyn and operated as a part of the Brooklyn Rapid Transit System.

The commission has sent to Senator O'Gorman at Washington the draft of a bill which he will introduce in Congress giving the city of New York permission to build the proposed subway for the Interborough Rapid Transit Company's Brooklyn tunnel under the post office building at Broadway and Mail Street. This property is owned by the national government, and while it is possible for the city now to get a revocable permit from the Secretary of the Treasury, there is no way of obtaining a permanent right. The commission's counsel has advised that a permanent right should be obtained, and the bill sent to Senator O'Gorman was therefore prepared. This bill, if passed, will authorize the Secretary of the Treasury to grant the city of New York a permanent right-of-way for the proposed subway under the Federal Building.

Franchise Negotiations Postponed in Toledo Pending Reorganization

At the request of Rathbun Fuller, who has represented the Toledo Railways & Light Company, Toledo, Ohio, in its negotiations with the city for the settlement of the franchise question, the negotiations have been postponed another month. Mr. Fuller stated that it will be necessary to come to some agreement in regard to the reorganization of the company before the negotiations can be concluded. The rate of fare is the only important question that has not yet been agreed to by the representatives of the company and the city.

At the regular meeting of the directors of the company on May 30, 1912, $90,000 was appropriated to double-track Monroe Street between Nineteenth Street and Lawrence Avenue.

Agreement Between Detroit United Railway Company and Its Employees

On May 27, 1912, the motormen and conductors of the Detroit (Mich.) United Railway approved the wage offer of the company after a few changes had been made, and the new contract was signed on May 29, 1912, by F. W. Brooks, general manager of the company, A. E. Peters, secretary of the company, and the representatives of the employees. The company has increased wages ½ cent an hour and has consented to pay the men double wages for overtime. The time in which the men are subject to call in each twenty-four hours has been reduced from thirteen hours to twelve and a half hours.

Former Congressman Alfred Lucking, who has been engaged to aid the corporation counsel of Detroit, Mich., in the litigation between the city and the Detroit United Railway, asserted in an interview on May 30, 1912, that the low-fare test in Cleveland is proving a success. He based his conclusion on a brief study of the subject made in Cleveland recently. The Tayler franchise in Cleveland is very much like the Webster franchise, which was formulated by the committee of fifty at Detroit when it attempted to reach a settlement of the street railway question in Detroit a few years ago.

John J. Stanley, president of the Cleveland Railway, was called to Detroit recently to testify in one of the cases. He stated that, according to his ideas of operating street railways, the 3-cent fare which is now in force in Cleveland would not prove a success.

Application for Extension of Omnibus Service in New York

The Fifth Avenue Coach Company, New York, N. Y., has applied to the Public Service Commission of the First District of New York for a franchise to extend its routes along Park and Madison Avenues from Eighty-sixth to Twenty-third Street, and along Seventh Avenue from Fifty-seventh to Thirty-third Street. The company runs a line of motor buses up Fifth Avenue from Washington Square to Fifty-seventh Street, thence along Broadway to Seventy-second Street, and thence along Riverside Drive to Grant's Tomb and 135th Street and Broadway. The company has also recently acquired a franchise for a branch line from Fifth Avenue to the Pennsylvania Station, by way of Thirty-third and Thirty-second Streets.

A hearing on the application was held before Commis-

sioner Eustis on June 5, 1912. Robert W. Meade, president of the company, spoke of the advantages which the motor buses offered for those who wished to travel directly along these routes, especially where there are no street cars, and said that the company is prepared to buy twenty-five additional coaches at a cost of $5,000 each.

Mr. Meade asserted that the company intended to put on a proper service if these franchises were awarded to it. The New York Transportation Company, which is a subsidiary of the New York Railways Company, controls the stock of the Fifth Avenue Coach Company. The hearing was adjourned to June 12.

A Tramway Strike Siege in Australia Which Involved Other Trades

In the report of the Brisbane (Australia) Electric Tramways Investment Company, Ltd., for the year 1911, presented at the meeting of the directors of the company in London, Eng., on May 21, 1912, H. R. Beeton, chairman of the board, referred at length to the recent strike of the employees of the company. This strike involved other trades and resolved itself into a very serious siege, although the company was successful. The following abstract has been made of the very interesting account presented by Mr. Beeton of the labor troubles and the legislation which in a measure provoked the employees to become arrogant by holding out a prospect of success to them through the creation of a single-headed labor court against whose award there was no appeal:

"Since the opening of the current year we have suffered from a strike which has seriously affected us, which has vitally concerned the Commonwealth of Australia, and which has interested the world at large. Under the laws of Queensland the wages, hours and conditions of labor are settled by wages boards consisting of an equal representation of masters and men in each trade with an independent chairman. With the operation of this law, known as the 'wages board act, 1908,' the company and its employees were satisfied, and the company had subsequently conceded an advance on the terms which had been settled by this tribunal. In pursuance, however, of the policy of the federal government, a law had been passed entitled 'the Commonwealth conciliation and arbitration act,' which constituted a court for the same purpose as the state wages board, but consisting of one judge, who was bound by no rules of evidence, who was entitled to refuse legal assistance to either party on the objection of the other, who had jurisdiction in all industrial disputes extending beyond the limits of a state, and against whose award there was no appeal. The ground being thus prepared, it was not long before industrial war broke out. Agitators sent up from Melbourne seduced a certain number of our men into registering themselves in a federal labor union as contemplated by the act, and, in conjunction with similar unions in other states, engineered in the same way, extraordinary demands were embodied in a 'plaint' which was forthwith presented for determination.

"Without waiting for a decision of the court the agitators resolved on Jan. 18 that the members of the federal union in the company's employ should wear union badges in violation of a regulation of the company promulgated to avoid the intimidation and coercion of its employees. The recalcitrants were interviewed by J. S. Badger, general manager of the company, and as they insisted on their right to wear the badge, they were not allowed to board the cars. By availing ourselves of the services of students who were under instructions for drivers, and of absent and retired employees who returned to work, we were able to continue a reduced service. Our depots and offices were picketed, but assisted by the constant presence of the police general quiet was preserved. The courts acted promptly, and £2 costs or a month's imprisonment was the standing penalty for abusive language. The storm, however, gained in intensity, and burst four days later, at 6 p.m. on Jan. 30, when a general strike of all trades was declared by a junta, representing forty-three unions, which met at the Trades Hall.

"The industrial crisis which followed this action was the worst in the history of Brisbane, if not in that of Australia. On the following day, although there was no great disorder, the union pickets were able to shut down practically all business. The shops, hotels and theatres closed; the railways, tramways and shipping were brought to a standstill, and loading and unloading in the depots and on the wharves was stopped. The tramways company was, of course, the storm center, and was the object of virulent attack. In these circumstances it redounds greatly to the credit of our general manager that, in spite of three futile attempts to blow up cars, no depredations on the company's property were committed, no injury to workmen ensued, no accidents occurred which were attributable to inexperience in driving, and, what is even more gratifying, there were no defections on the part of our non-union employees, and we are now entirely free of the federal union. Moreover, the strike has had the effect of routing the Labor party both in South Australia, where a general election occurred during the progress of the strike, and in Queensland, where a general election has occurred since.

"The history of the strike reads like the account of a siege. Our depot at Countess Street was surrounded with barbed wire entanglements; we had a large number of men on guard well armed, the fire hose and the hot-water hose both ready, and all the windows of the power station protected with iron inside. For five days the office staff, except such as could make a show in case of attack, were dismissed, and no attempt was made to do business. Most of the men were quartered at the different depots, and we established a provisioning department, which was conducted under great difficulties. Our steam lorry was fitted up with armor and placed at the disposal of the government, which used it for carting supplies under police escort to the hospitals and other places. Notwithstanding the fact that all the engineers except the chief left suddenly, we were able to keep the power station running. On Jan. 31 Mr. Denham, the prime minister, telegraphed to the federal government for military aid to maintain order under the provisions of the constitution, but Mr. Fisher unfortunately replied to the effect that, having heard both sides, he saw no reason to interfere.

"The farmers, however, when they found that the market for their perishable products was being obstructed by well-paid men acting in obedience to the orders of professional agitators, came into the city on horseback to assist the forces of conservatism, and thanks to the energy of the Queensland government on Feb. 2 a sufficient force of special constables was organized to cope with the situation. The police stopped all processions and broke up all gatherings. On Feb. 3 some shops reopened, and on Feb. 5 we started some cars with a posse of police on each and amid popular acclamation. Unfortunately, the action of the federal judge in granting jurisdiction to the strikers and in summoning Mr. Badger to a compulsory conference in Melbourne on Feb. 13 protracted the strike. The people of Australia, who had watched Mr. Badger's conduct from the first, made his journey to Melbourne the occasion of extraordinary demonstrations of public approval. After three days' session the conference came to nothing, and the judge immediately remitted the issue to his court, where he affirmed the right to wear the badge, but was unable to compel the reinstatement of the discharged employees. In the meantime, all the vacancies having been filled, the men who went on strike, while they received permission to wear their badges, found themselves without work, and the company was accordingly placed in a position to plead in the 'plaint' that it had no dispute, for the reason that no members of the claimant association were in its employment, and that as we had a full staff, from engineers to point boys, it was not necessary to employ any of them. We have since obtained from the High Court a prohibitive injunction against the award pending the hearing of the principal suit, which we hope to defeat on the ground of jurisdiction."

Decision in Regard to Schedules in Cleveland

The board of arbitration which was selected some time ago to settle the disagreement between the Cleveland Railway and the city over the new schedule on Superior Avenue, as fixed by the city, decided on June 4, 1912, that the right of the city to control schedules and service is absolute and not subject to arbitration. The members of the

board were F. H. Goff, president of the Cleveland Trust Company, who represented the Cleveland Electric Railway during the final negotiations with former Mayor Johnson, chairman; Warren Bicknell, president of the Cleveland Construction Company, and A. B. du Pont. Mr. Goff submitted the matter to John G. White and S. H. Tolles, well-known attorneys, and the decision made by the arbitrators was based upon their opinions. Mr. White stated that it is clearly the purpose of the ordinance to exclude arbitration of the schedules, but that the union had contract rights with the company which might possibly affect the situation. Mr. Tolles held that the contract between the union and the company is void. In reply to an inquiry from Mr. Goff, the company said that the Superior Avenue schedule was satisfactory. Mr. Davies, representing the men, said the schedule would be satisfactory to them if a second extra car was operated at certain hours of the day and evening.

An ordinance is being prepared to provide for the extension of the Lorain Avenue line to Lindale under the low-fare agreement.

An increase in wages of about 10 cents a day has been given to the tracklayers who went on strike two weeks ago and the men have returned to work.

New Road Opened in Louisiana.—The Southwestern Traction & Power Company has completed the construction of its line between New Iberia and Jeanerette, La., and has established a half-hourly service between those places. The power plant and shops are at New Iberia.

Application for Franchise for Elevated Railway in Los Angeles.—Anson W. Delane, 404 Higgins Building, Los Angeles, Cal., has applied to the Council of that city for a franchise to construct a system of elevated railways there. The application has been referred by the Council to the Board of Public Utilities for investigation and report. Mr. Delane states that he will ask the county authorities for the right to continue the lines to Ocean Park and Venice.

New Power Station in Chicago.—The Commonwealth Edison Company, Chicago, Ill., has purchased a 22-acre tract of land in the southeastern portion of the city situated on the east side of the Calumet River, between Ninety-eighth and One Hundredth Streets. It is understood that the company will construct a power station on the property with a view to assuming the load of the steam railroads to be electrified, which enter Chicago from the south and southeast.

Franchise Carried in Santa Barbara.—At the municipal election held in Santa Barbara, Cal., on May 23, 1912, the voters sanctioned the plan to extend the franchise of the Santa Barbara Consolidated Street Railway for a long term on the condition that the company carry out at once the proposed rehabilitation plan, which will involve the expenditure of $200,000. The voters also decided in favor of home rule in the relations of the city with the local public service corporations.

Vote on Municipal Ownership in Merrill.—The Common Council of Merrill, Wis., has recommended a bond issue of $200,000 to provide funds to construct a municipal railroad, and the city officials in a resolution have proposed a special election to submit the project to a vote of the people. It is planned to construct a standard gage line from Merrill west toward Athens. Of the total cost of the proposed line, Merrill will issue bonds for $65,000 and the county will issue bonds for $135,000.

Sale of Carhouse Property in New York.—The New York (N. Y.) Railways has sold the block bounded by Lexington and Fourth Avenues, Thirty-second and Thirty-third Streets, New York, where the company's Fourth Avenue carhouse was located. The new Vanderbilt Hotel and the Park Avenue Hotel are opposite the property, and the Seventy-first Regiment Armory is one block north. The carhouse was erected during the old horse car days, and the site of the structure is now in the heart of the new section uptown which is being developed for business and hotel purposes.

Bill Passed for Consolidation of New Haven Company's Electric Railways in Massachusetts.—Both the House and Senate of Massachusetts passed on June 4, 1912, the bill which provides for the incorporation of the Worcester, Springfield & Berkshire Street Railway as a consolidation of the electric railway holdings of the New York, New Haven & Hartford Railroad in western Massachusetts with the Worcester and Springfield systems. The measure is now before Governor Foss for his signature. Reference to this measure was made at length in the department "Legislation Affecting Electric Railways" in the Electric Railway Journal of April 20, 1912.

Decision Announced in Regard to Fenders in New Orleans.—Hugh McCloskey, president of the New Orleans Railway & Light Company, New Orleans, La., has announced the decision of the company in regard to the question of equipping its cars with fenders in a letter to the Mayor which follows in part: "I desire to state that as a result of the two tests of the fenders at the carhouses of this company, the company is convinced that fender No. 5, known as the Heer fender, has proved the most satisfactory, and it is, therefore, submitted for the approval of the Council. As this fender will be made locally and entirely with home labor, we are anxious to get prompt action, so that there may be no delay in equipping the cars with the device." It is understood that this fender was perfected by an employee of the company.

British Columbia Electric Railway to Erect Steam Turbine Auxiliary Plant at Saanich.—In addition to the new hydroelectric generating station completed recently on the Jordan River, Vancouver Island, B. C., the British Columbia Electric Railway will erect a new station on the island at Tod Inlet in order to take care of the rapidly increasing railway and lighting load in Victoria and the new interurban line which is being built between Victoria and the Saanich peninsula. Charles C. Moore & Company, San Francisco, Cal., have signed a contract with the railway which covers the station and its equipment. There will be two 2000-kw Allis-Chalmers turbine units fitted with surface condensers and connected to generators wound for 2300 volts, 60 cycles. The steam equipment will comprise six Babcock & Wilcox boilers fitted with superheaters and oil burners. The station structure will be of reinforced concrete. The stack will be of similar construction and will be 248 ft. high and 11 ft. in diameter at the top. In addition the company will install a 1000-kw motor-generator set for railway service. The Saanich Inlet line will be 22 miles long.

Action to Compel Operation of Line in New York City.—The Commission of the First District of New York has directed its counsel to begin mandamus proceedings to compel the New York (N. Y.) Railways to construct and operate that portion of its surface railroad route on East 116th Street between Pleasant Avenue and the East River. There is a ferry leading to Ward's Island, where is located the Manhattan State Hospital, the authorities of which complained to the commission that travel to and from the island was hampered by the failure of the company to run its cars clear through to the East River. Its present terminus at Pleasant Avenue is several blocks from the ferry, and passengers are compelled to walk this distance. The commission ascertained that the company's franchise extends to the river, and the commission holds that the franchise obligates the company to operate the entire route. It has called upon the company to extend the line to the river and put it in operation by Aug. 1, 1912. As no move has been made by the company to do so, the commission resorted to mandamus proceedings to compel the company to build and operate the extension.

Electrical World Convention Issue.—In connection with the thirty-seventh convention of the National Electric Light Association, to be held in Seattle, Wash., June 10-14, the *Electrical World* appears under date of June 1, 1912, as a "Convention Number" in a size and form that breaks many records in publication of technical journals. Most of the text matter refers to Far Western electrical developments. The advertising pages number about 450 and contain 750 different advertisements, varying from one-sixteenth of a page to thirty-two pages. Each copy of this issue of the *World* weighs about 4 lb., and the total edition required more than 100,000 lb. of paper, or 910 reams. The thirty-two page advertisements tell the stories of concerns particularly identified with Northwestern public service enterprises and with central station service in general. The advertising is divided into sections, each with a separate title

page, and many of the sections are larger than the average issue of technical journals. Even more noteworthy than its size is the thoroughly representative character of the text and advertising of this issue, comprising matter pertaining to every phase of the electrical industry and representing most of the important electrical manufacturers of the United States.

Electric Railways: A Look Ahead.—Gen. William A. Bancroft, president of the Boston (Mass.) Elevated Railway, concluded as follows a very interesting article entitled "Electric Railways: A Look Ahead," which he contributed to a recent special issue of the *Christian Science Monitor* of Boston: "The directors of the Boston Elevated Railway have thus far shown themselves as conscious of their obligations as any body of men possibly could be. Under their policy the community has been provided with service which, whatever its imperfections, is not exceled anywhere for lowness of fare, for distances carried and for the extent of its operations. A counter obligation rests on the public to co-operate with the purveyors of satisfactory transportation in permitting future progress to be sure and safe rather than hurried and liable to interruption. The burden of waste, of unnecessary expense and premature, ill-considered projects falls in the last analysis on the public. The prosperity, on the other hand, which comes from good management under favorable contractual relations between the company and the community is shared by everybody. All benefit from the quality of the service. No injury through excessive profit taking is possible, for under the terms of incorporation everything above small returns upon the investment of capital must be shared with the public."

New Massachusetts Compensation Law.—The workmen's compensation law enacted by the Massachusetts Legislature will go into effect on July 1, 1912. This measure abolishes the rule of contributory negligence, negligence of fellow servants and the assumption of risk laws and court rulings; allows a person half his regular earnings for a maximum of 300 weeks if partly incapacitated in an accident while working, and gives the employee half pay for a period of 500 weeks if he is totally disabled for work by any such accident. It adds from $4 to $10 a week to this allowance for 100 weeks if he loses both hands or both feet, or 10 per cent if sight of both eyes; makes this additional allowance for fifty weeks if he loses one hand or one foot, or 10 per cent if sight of one eye; furnishes him with the added compensation for twenty-five weeks for the loss of two or more fingers, thumbs or toes, and for twelve weeks for the loss of one finger or one toe. It sets the employee's half-pay allowance at a minimum of $4 a week and a maximum of $10, with a limit of $3,000 for total disability. In case the employee is killed his dependent relatives are to receive the equivalent of this half pay for 300 weeks, and if he has no dependent relatives $200 is allowed for his funeral expenses. The law will, with the exception of domestic servants and farm laborers, cover all cases where accidents occur to wage workers of either sex while at work for their employers.

Proposed Terminal Changes Considered at Toronto.—Some time ago the Toronto & York Radial Railway, Toronto, Ont., purchased land to extend its terminal facilities at North Toronto. The company proposed to enter its extended yards by deviating its present Metropolitan main line track and filed plans with the Ontario Railway & Municipal Board showing roughly the proposed deviation, which was to be carried out at an estimated cost of $170,000. A meeting of the board was held recently to consider more pretentious plans, prepared by J. F. W. Wise at the solicitation of the company, showing how the company could approach the proposed extended terminal by overhead tracks. The estimated cost of this undertaking was $700,000. H. L. Drayton, corporation counsel of Toronto, told the board recently that the city was anxious to have the radial railway abandon the highways; that the city would not oppose the company's proposals on that score, but that the feeling prevailed that the company ought not to ask the city to approve a plan whereby the railway would extend its present freight terminals, as the city was opposed to freight terminals on Yonge Street. H. J. Wright, counsel for the company, in commenting upon the the plans submitted to the Railway Board by Mr. Wise, said the company had given them careful consideration, but objected to carrying out such a scheme as it involved too large an expenditure for the company to bear alone. Mr. Wright stated that Mr. Wise's plan had been fruitful to the company in suggestions and that by revising the plan which the company drew up about two years ago the problem could be solved satisfactorily. Mr. Drayton said that the city did not feel that it should be called upon to share the cost of elevating the company's tracks. Chairman Leitch, after considering the question briefly with Commissioners Kittson and Ingram, told Mr. Wright to have the company prepare plans for the deviation of the tracks at grade, showing how the company proposed to protect the traveling public, and to file the plans for consideration by the board.

PROGRAMS OF ASSOCIATION MEETINGS

Street Railway Association of the State of New York

The thirtieth annual convention of the Street Railway Association of the State of New York will be held at the United States Hotel, Saratoga, N. Y., on June 26 and 27, 1912. The banquet will be held on the evening of June 25.

June Meeting of the Public Service Company Section of the A. E. R. A.

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J.; H. C. Donecker, secretary of the American Electric Railway Association; J. J. Burleigh, second vice-president of the Public Service Railway, and R. E. Danforth, general manager of the Public Service Railway, will address the June meeting of the Public Service Company section of the American Electric Railway Association. There will be no presentation or discussion of papers at this meeting. The meeting will be held at 8 p. m. on June 11, 1912, in the Public Service Building, Newark.

M. C. B. and M. M. Conventions

The following summary has been prepared from the pamphlet program of the annual convention of the Master Car Builders' Association to be held at Atlantic City, N. J., on June 12, 13 and 14, 1912:

JUNE 12—MORNING SESSION.

Business meeting. Reports on: Nominations, Revision of Constitution, Revision of Standards and Recommended Practice, Train Brake and Signal Equipment, Brake Shoe Equipment, Car Wheels.

JUNE 13—MORNING SESSION.

Discussion of Reports on: Safety Appliances, Rules of Interchange, Prices for Labor and Materials, Rules for Loading Materials, Damage to Freight Equipment by Unloading Machines, Overhead Inspection, Coupler and Draft Equipment, Car Trucks, Springs for Car Trucks, Consolidation Train Lighting and Equipment.

JUNE 14—MORNING SESSION.

Paper, "Car Shop Apprentices," by I. S. Downing, master car builder of the Lake Shore & Michigan Southern Railway.

Discussion of reports on: Train Pipe and Connections for Steam Heat, Tank Cars, Specifications for Tests of Steel Truck Sides and Bolsters, Capacity Marking of Cars, Lettering Cars.

The following summary has been prepared from the pamphlet program of the annual convention of the American Railway Master Mechanics' Association to be held at Atlantic City, N. J., on June 17, 18 and 19, 1912:

JUNE 17—MORNING SESSION.

Business session, followed by the discussion of reports on: Advisory, Technical, Mechanical Stokers, Revision of Standards, Specifications for Cast-Steel Locomotive Frames.

JUNE 18—MORNING SESSION.

Discussion of Reports on: Main and Side Rods, Consolidation, Safety Valves, Safety Appliances, Design, Construction and Maintenance of Locomotive Boilers, Contour of Tires, Steel Tires.

Paper, "Increased Power Obtained with Superheat as Compared with the Maximum Power Obtained with Saturated Steam," Profs. C. H. Benjamin and L. E. Endsley.

JUNE 19—MORNING SESSION.

Discussion of reports on: Flange Lubrication, Minimum Requirements for Headlights, Standardization of Tinware, Maintenance of Superheater Locomotives.

International Street & Interurban Railway Association

The program of the convention at Christiania, Norway, of the International Street & Interurban Railway Association has just been announced. The meeting is to be held July 2 to July 5. At the conclusion of the meeting there will be a trip to Bergen to give the delegates an opportunity to see the interesting fjords of the western coast of Norway and, for those who desire it, a trip by water as far north as North Cape. The papers to be presented at the convention are:

1. "Relation of City Transportation Systems to the Development of Cities," by L. Dausset, member and formerly president of the City Council of Paris.

2. "The Effect of Tramways on Housing Conditions in Large Cities," by Mr. Kühles, member City Council, Munich.

3. "Independent Motor Cars on Steam Railroad Lines, Branch Steam Railroad Lines and Interurban Lines," by E. A. Ziffer, Count of Teschenbruck and president of the Bukowina Railways, Vienna.

4. "The Best Methods of Caring for Large Crowds in Cities," by Mr. Hradetsky, manager Municipal Tramways of Vienna.

5. "Interpole Electric Motors," by L. Bacqueyrisse, engineer of construction General Omnibus Company, Paris, and Mr. Eisig, manager Municipal Tramways, Chemnitz.

6. "The Rules in Germany in Regard to Railway Return Circuits and Electrolysis," by Mr. Buschbaum, civil engineer, Berlin.

7. "The Maintenance of Overhead Lines Including the Distribution System," by E. d'Hoop, manager engineering department Brussels Tramway Company, and Mr. Otto, manager Grosse Berliner Strassenbahn, Berlin.

8. "Carhouse Design in Its Relation to the General Layout of the System; Organization of the Work in Carhouses," by J. H. Neiszen, manager Municipal Tramways, Amsterdam.

9. "Rail Corrugation," by A. Busse, chief engineer Grosse Berliner Strassenbahn, Berlin.

10. "Snow Removal," by T. Poppe, manager Kristiania Sporveisselskab, Christiania.

11. "The Relations of City Railways, Interurban Railways and Steam Railroads, and the Possibilities of Interchange of Passengers, Freight and Rolling Stock," by Mr. Campiglio, president Italian Tramway & Interurban Railway Company, Milan.

12. "Fare Collection of Interurban Lines," by G. Lembourg, engineer to manager Société Nationale des Chemins de fer vicinaux, Brussels.

13. "Methods of Car Lighting and Heating on Interurban Lines," by F. de Le Hoye, superintendent of rolling stock Société nationale des Chemins de fer vicinaux, Brussels.

14. Address on the 250,000-hp hydroelectric installation at Rjunkanfos and the production there of artificial nitrates.

The office for registration for delegates will be opened at the Handelsstandens Forening (Commercial Club), Christiania, on July 1 from noon to 8 p. m. Delegates are requested to secure at that time programs and badges which will be good for free transportation up to July 22 on the tramway lines in Christiania and Bergen. At 9 p.m. there will be a reception to delegates by the local committee at Dronningen.

At 9:30 a. m. on Tuesday, July 2, the first session of the association will be held at the Commercial Club. In the afternoon there will be an excursion to Holmenkollen.

The second technical session of the association will be held on Wednesday morning and the third on Wednesday afternoon at the Commercial Club. There will be a fourth session Thursday morning. Thursday afternoon the delegates will be guests at a banquet at which the hosts will be the officers of the Christiana tramways.

On July 5 there will be an all-day excursion to Kykkelsrud and on July 6 and 7 visits to Bergen.

Financial and Corporate

Stock and Money Markets

June 5, 1912.

The tone to-day of the market for securities traded in on the New York Stock Exchange was firm. This was accounted for as due not so much to any very large demand but rather to an absence of pressure upon prices and to the natural effect of the readjustment which followed last week's decline. The improvement to-day, however, was not confined to the stocks which were subjected to the heavy selling a few days ago. Rates in the money market were: Call, 2½ per cent @ 3 per cent; sixty days, 3 per cent @ 3¼ per cent; ninety days, 3¼ per cent @ 3½ per cent.

In the Philadelphia market sales were recorded of small lots of Union Traction, United Gas Improvement and a number of the industrials.

In the Chicago market neither the stocks nor the bonds of the traction companies were traded in to any extent. The most important bond transaction was the sale of $12,000 of Chicago City Railway 5's.

In the Boston market small sales were recorded of Boston Elevated and Massachusetts Electric and of West End preferred. The market was active at the close.

There was very little trading in the Baltimore market to-day, but prices were steady.

Quotations of traction and manufacturing securities as compared with last week follow:

	May 29.	June 4.
American Brake Shoe & Foundry (common)	95½	a96
American Brake Shoe & Foundry (preferred)	a137	137
American Cities Company (common)	...	...
American Cities Company (preferred)	...	...
American Light & Traction Company (common)	a308	a308
American Light & Traction Company (preferred)	a110	a110
American Railways Company	a44	a43¾
Aurora, Elgin & Chicago Railroad (common)	a45½	a45
Aurora, Elgin & Chicago Railroad (preferred)	a87½	a88
Boston Elevated Railway	a129	a128
Boston Suburban Electric Companies (common)	a15	a15
Boston Suburban Electric Companies (preferred)	78	78
Boston & Worcester Electric Companies (common)	a10½	a10½
Boston & Worcester Electric Companies (preferred)	a54	a54
Brooklyn Rapid Transit Company	89¼	88⅛
Capital Traction Company, Washington	a127¾	126¾
Chicago City Railway	a190	*190
Chicago Elevated Railways (common)	a40	a36
Chicago Elevated Railways (preferred)	a92	a92
Chicago Railways, ptcptg., ctf. 1	a95	a96
Chicago Railways, ptcptg., ctf. 2	a30	a30
Chicago Railways, ptcptg., ctf. 3	a9	a9½
Chicago Railways, ptcptg., ctf. 4	a5	a5
Cincinnati Street Railway	a130	a130
Cleveland Railway	a106	a106
Cleveland, Southwestern & Columbus Ry. (common)	*5	*5
Cleveland, Southwestern & Columbus Ry. (preferred)	a32	*32
Columbus Railway & Light Company	a55	a55
Columbus Railway (common)	80	80
Columbus Railway (preferred)	a95	a95
Dayton Street Railway (common)	a25	a25
Dayton Street Railway (preferred)	a100	a100
Denver & Northwestern Railway	*135	*135
Detroit United Railway	a72	a72
General Electric Company	a171	a170½
Georgia Railway & Electric Company (common)	a125	a124¾
Georgia Railway & Electric Company (preferred)	a85¾	a86
Interborough Metropolitan Company (common)	21	20
Interborough Metropolitan Company (preferred)	60	57⅞
International Traction Co., 4% bond, rcts.	*75	*75
Indiana Union Traction Company	*7	*7
Kansas City Railway & Light Company (common)	a22	a21
Kansas City Railway & Light Company (preferred)	46	a48
Lake Shore Electric Railway (common)	*7	*7
Lake Shore Electric Railroad (1st preferred)	*91½	*91½
Lake Shore Electric Railway (2d preferred)	*27	*27
Manhattan Railway	135⅛	137
Massachusetts Electric Companies (common)	a21¼	a20½
Massachusetts Electric Companies (preferred)	a94	92
Milwaukee Electric Railway & Light (preferred)	*104½	*104½
Norfolk Railway & Light Co.	*27	*27
North American Company	82½	83½
Northern Ohio Light & Traction Company (common)	a70	a70
Northern Ohio Light & Traction Company (preferred)	a105	a105
Philadelphia Company, Pittsburgh (preferred)	52	a51½
Philadelphia Company, Pittsburgh (common)	43¾	43¾
Philadelphia Rapid Transit Company	22⅞	a23
Portland Railway, Light & Power Company	*68½	*68½
Public Service Corporation	112	a111
Third Avenue Railway, New York	a39	a39
Toledo Railways & Light Company	6⅞	5½
Twin City Rapid Transit Co., Minneapolis (common)	a109	a107½
United Rys. & Electric Company (Baltimore)	a24	a24¼
United Rys. Inv. Co. (common)	a32	30
United Rys. Inv. Co. (preferred)	60	60
Virginia Railway & Power Company (common)	47⅝	a50
Virginia Railway & Power Company (preferred)	88	89
Washington Ry. & Electric Company (common)	a89⅞	a89½
Washington Ry. & Electric Company (preferred)	a95	a95
West End Street Railway, Boston (common)	a85	a85
West End Street Railway, Boston (preferred)	a101½	a101
Westinghouse Elec. & Mfg. Co.	a73½	a74
Westinghouse Elec. & Mfg. Co. (1st preferred)	a120	a120

*Last sale. a Asked.

ANNUAL REPORT

West Jersey & Seashore Railroad

In his remarks to shareholders, James McCrea, president of the West Jersey & Seashore Railroad, refers incidentally to matters that affect the portion of the road which is operated by electricity, as follows:

"The total operating revenues from the rail lines for the year show an increase of $265,993, or 4.45 per cent, and the operating expenses $262,376, or 5.79 per cent, due principally to increased wages and to the fact that your company made the necessary provision for the depreciation of the electric line equipment. The taxes for the year show a substantial increase, but their effect was neutralized by an increase in rentals and by a decrease in other payments of the company, so that the net income for the year was $709,934, a decrease of only $22,903. After paying dividends of 6 per cent on the special guaranteed stock and 5 per cent on the common stock, there remained a balance of $221,614, which was transferred to the 'reserve for additions and betterments' for future improvements which should not be capitalized.

"The value of equipment on the general balance sheet includes $2,152, covering equipment purchased during the year 1911, out of the 'reserve for depreciation of equipment' established under the regulations of the Interstate Commerce Commission through charges against operating expenses. From the total cost of road and equipment there is deducted, as will be noted on the balance sheet, 'reserve for accrued depreciation of road and equipment,' amounting, since June 30, 1907, to $20,864 for road which is chiefly on the electric power transmission system, and $188,496 for equipment, so that the net value of the road and equipment can be ascertained.

"In accordance with these regulations the accrued depreciation can be reduced only to the extent of the original cost of the equipment retired, but as the original cost is not sufficient to replace the equipment retired and provide for the accrued depreciation, your company, in conformity with its established practice, will maintain the standard and value of the equipment by utilizing any balance in purchasing new equipment, and therefore the amount which remained unapplied Dec. 31, 1911, namely, $186,344, will be spent hereafter for equipment."

A statement of the equipment depreciation reserve follows:

Credit balance, Jan. 1, 1911		$352,726
Credits during year 1911 from charges to operating expenses:		
[illegible]	$252,898	
Renewals	2,608	
Credits during year 1911 from salvage	138,206	
		393,712
Total credits		$746,438
Less equipment retired:		
Locomotives	$48,893	
Passenger cars	505,662	
Freight cars	1,860	
Work equipment	1,527	
		$557,943
Credit balance, Dec. 31, 1911		$188,496
Expended out of the above for new equipment		2,152
Balance unexpended		$186,344

Allentown & Reading Traction Company, Allentown, Pa.—Application has been made for the appointment of a receiver for the Allentown & Reading Traction Company by John H. Passmore, a stockholder of the Kutztown & Fleetwood Street Railway, which is leased to the Allentown & Reading Traction Company. Mr. Passmore alleges that the Allentown & Reading Traction Company is insolvent.

Brooklyn (N. Y.) Rapid Transit Company.—The South Brooklyn Railway is seeking permission from the Public Service Commission to buy the capital stock of the Prospect Park & South Brooklyn Railroad, consisting of 500 shares of $100 each, and of the New York & Coney Island Railroad, consisting of 1000 shares of $100 each. These companies own the right of way to Coney Island, known as the West End line, over which the Brooklyn Rapid Transit Company operates. They are subsidiaries of the latter.

Chicago & Oak Park Elevated Railway, Chicago, Ill.—F. V. Dobbins, receiver of the Chicago & Oak Park Elevated Railway, organized under the laws of New Jersey as a holding company to control the Chicago & Oak Park Elevated Railroad, will sell at public auction on June 20, 1912, all the securities of the Chicago & Oak Park Elevated Railroad held by the Chicago & Oak Park Elevated Railway.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—Plans for refinancing the Cleveland, Southwestern & Columbus Railway contemplate, it is reported, the retirement of all the underlying issues of the company leaving the first and refunding mortgage as the only mortgage against the property. About $6,500,000 of the first mortgage bonds will be outstanding if the plan is consummated, leaving all other debts paid and some money on hand for improvements. After the underlying bonds are retired and the floating debt has been funded, it is reported that the company will divide its preferred stock of $2,400,000 into $1,200,000 of 6 per cent first cumulative preferred and an equal amount of 5 per cent second non-cumulative preferred. To do this the holders of the preferred stock will have to waive their accumulated dividends.

Columbus, Delaware & Marion Railway, Marion, Ohio.—The Troy Trust Company, Troy, N. Y., trustee for the bondholders of the Columbus, Delaware & Marion Railway, has brought proceedings through Attorney E. B. Finley, Bucyrus, Ohio, in the Marion County courts for an accounting from the Cincinnati Trust Company, Cincinnati, Ohio, former trustee for the bondholders, and for the foreclosure of the mortgage for $500,000. The petition states that the Cincinnati Trust Company was removed as trustee in March by the holders of three-fourths of the outstanding bonds. The petition also states that on Sept. 1, 1909, the semi-annual interest on the bonds became due and was not paid, and that no interest has been paid since that time. An entry was made in the courts at Springfield on May 28, 1912, in the case of Eli West, receiver of the Columbus, Delaware & Marion Electric Railway, against John G. Webb and others, in favor of the plaintiff. The judgment is for $1,059,083, and $500 for the master commissioner, Judge W. M. Rockwell. The company is held contingently liable for bonds received from other companies to the amount of $900,000.

Grand Valley Railway, Brantford, Ont.—The Grand Valley Railway, including the Brantford Street Railway, has been sold to a representative of the Toronto Trust Company, which is said to be acting for the Canadian General Electric Company, the principal bondholder of the company. As stated in the ELECTRIC RAILWAY JOURNAL of March 16, 1912, page 439, the Brantford Street Railway defaulted recently in the payment of the interest due on its bonds.

Indianapolis, Crawfordsville & Danville Traction Company, Crawfordsville, Ind.—Joseph T. Elliott & Sons, Indianapolis, Ind., who purchased the property of the Indianapolis, Crawfordsville & Western Traction Company at foreclosure recently and were interested in organizing the Indianapolis, Crawfordsville & Danville Traction Company as its successor, are reported to have concluded a lease of the property for 999 years to the Terre Haute, Indianapolis & Eastern Traction Company.

Interborough Rapid Transit Company, New York, N. Y.—With the closing on June 5, 1912, of the books for the syndicate handling the forthcoming issue of $170,000,000 of bonds of the Interborough Rapid Transit Company, it was announced that subscriptions in excess of the offering had been received by the managers, J. P. Morgan & Company. The actual award of the bonds will be deferred until the courts pass on the legality of the arrangement for preferential payments by the city in connection with the proposed rapid transit development.

Jackson Light & Traction Company, Jackson, Miss.—The Jackson Light & Traction Company has been incorporated to succeed the Jackson Railway & Light Company, the property of which was recently purchased by Kelsey, Brewer & Company, Chicago, Ill., as noted in the ELECTRIC RAILWAY JOURNAL of May 4, 1912, page 771. The company is capitalized at $1,600,000, $1,000,000 of which is common stock and $600,000 preferred stock. Of the preferred stock, $520,000 has been issued. The authorized amount of bonds is $,2,500,000. Of this amount, $700,000 has been issued, $160,000 is to be held in reserve and $850,000 is to be issued

within a short time. On June 6, 1912, P. N. Brooks & Company, New York, N. Y., offered for sale at 96 and interest the balance of the issue of $700,000 of first mortgage sinking fund 5 per cent gold bonds of the company, due April 1, 1922.

London (Ont.) Street Railway.—The stock of the London Street Railway is being deposited with the National Trust Company, Toronto, Ont., subject to sale under an offer said to have been made in behalf of Sir William MacKenzie.

Marshalltown Light, Power & Railway Company, Marshalltown, Iowa.—W. G. Dows and John A. Reed, Cedar Rapids, Iowa, have had granted them by the Marshalltown voters the railway and light franchises for which they applied, and they expect to exercise the option which they and their associates have secured on the property of the Marshalltown Light, Power & Railway Company.

New York (N. Y.) Railways.—The New York Railways has applied to the Public Service Commission of the First District of New York for permission to issue $754,000 of bonds to refund an issue of $600,000 of bonds of the Metropolitan Crosstown Railway, one of its subsidiaries. The bonds would be issued at 4 per cent, under the mortgage dated Jan. 1, 1912, in the Metropolitan Street Railway reorganization proceedings. The $600,000 of bonds of the Metropolitan Crosstown Railway were issued on April 1, 1890. During the bankruptcy of the Metropolitan Street Railway, of which the Metropolitan Crosstown Railway was a subsidiary, the interest was defaulted, and the New York Trust Company, as trustee, began an action to foreclose. This action is still pending. The New York Railways now proposes to pay off the old bond issue by the issue of its own bonds. A hearing will be held on June 13.

Northern Electric Railway, San Francisco, Cal.—The Northern Electric Railway has applied to the State for permission to issue bonds to the amount of $1,100,000 to provide funds to build an extension from Marysville, through Colusa to Meridian, and to construct a bridge across the Sacramento River.

Public Utilities, Light, Heat & Power Company, Wilmington, Del.—The Public Utilities, Light, Heat & Power Company has been chartered under the laws of Delaware with a nominal capitalization of $500,000 by interests identified with the Wilmington Southern Traction Company. The new company will be operated in connection with the Wilmington Southern Traction Company, formerly a part of the Wilmington, New Castle & Southern Railway. The Public Utilities, Light, Heat & Power Company has applied for a franchise to do a general light and power business in Wilmington.

Tennessee Railway, Light & Power Company, Nashville, Tenn.—The Tennessee Railway, Light & Power Company, which has taken over the Nashville Railway & Light Company, Chattanooga Railway & Light Company, Tennessee Power Company and the Cleveland (Tenn.) Electric Light Company, has organized as follows: H. M. Byllesby, president; E. W. Clark, G. E. Hardy and F. C. Walcott, vice-presidents; Robert E. Graf, secretary; John W. O'Brien, treasurer; Matthew A. Morrison, William Lilley and Jacob Hekma, assistant secretaries and assistant treasurers; Edward W. Clark, C. M. Clark, Anton G. Hodenpyl and George E. Hardy, New York; H. M. Byllesby, Chicago; Otto E. Osthoff, Frederic C. Walcott and Orlando B. Wilcox, New York, and John W. Barr, Jr., Louisville, directors.

Toledo & Northwestern Railway, Jackson, Mich.—The Toledo & Northwestern Railway, projected originally as an electric railway and abandoned several years ago after having been partially completed, will be succeeded by the Albion, Brookfield & Charlotte Railway, which has taken over the property. The new company has organized as follows: L. C. Davis, Chicago, president; E. Ellerthrope, Jackson, vice-president and treasurer; Charles H. White, Chicago, secretary. The line as now proposed will extend from Albion to Charlotte, via Duck Lake. It is stated that gasoline motor cars will be used on the line.

Warren, Brookfield & Spencer Street Railway, Brookfield, Mass.—The Warren, Brookfield & Spencer Street Railway has been placed in the hands of Thomas T. Robinson, Dedham, Mass., as receiver on the application of the International Trust Company, Boston, Mass., trustee of the mortgage securing $125,000 of 5 per cent bonds. As stated in the Electric Railway Journal of May 11, 1912, page 808, the railway company defaulted in the payment of the interest which was due on these bonds on May 1, 1912.

Dividends Declared

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Baton Rouge (La.) Electric Company, 3 per cent, preferred.

Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1¼ per cent.

Chicago (Ill.) City Railway, quarterly, 2¼ per cent.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred; quarterly, 1¼ per cent, common.

Manila Electric Railroad & Lighting Corporation, Manila, P. I., quarterly, 1½ per cent.

Massachusetts Electric Companies, Boston, Mass., 2 per cent, preferred.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD

Period			Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Income.
1 m.,	Apr.,	'12	$141,975	$82,601	$59,374	$36,970	$22,405
1 "	"	'11	130,914	78,036	52,877	35,571	17,306
10 "	"	'12	1,504,800	848,824	655,976	367,307	288,669
10 "	"	'11	1,421,542	822,187	599,355	344,264	255,091

COMMONWEALTH POWER RAILWAY & LIGHT COMPANY

1 m.,	Apr.,	'12	$490,119	*$285,632	$204,487	$120,911	$83,576
1 "	"	'11	421,924	*246,197	175,727	105,081	70,646
4 "	"	'12	2,007,486	*1,163,754	843,732	455,325	388,407
4 "	"	'11	1,773,761	*1,000,572	773,189	408,214	364,975

EAST ST. LOUIS & SUBURBAN COMPANY

1 m.,	Apr.,	'12	$179,744	*$104,779	$74,965	$47,962	$27,003
1 "	"	'11	178,507	*106,155	72,352	45,433	26,919
4 "	"	'12	757,607	*428,659	328,948	192,258	136,690
4 "	"	'11	712,803	*413,419	299,384	181,724	117,660

GALVESTON ELECTRIC COMPANY

1 m.,	Mar.,	'12	$32,846	$20,731	$12,115	$7,754	$4,360
1 "	"	'11	31,645	21,071	10,574	6,799	3,775
12 "	"	'12	455,858	260,363	195,495	77,391	108,104
12 "	"	'11	377,426	232,846	144,586	75 477	1 8,104

GRAND RAPIDS RAILWAY

1 m.,	Apr.,	'12	$94,339	*$55,191	$39,148	$14,515	$24,633
1 "	"	'11	89,967	*54,348	35,619	15,038	20.581
4 "	"	'12	382,013	*219,880	162,133	58.632	103,501
4 "	"	'11	353,576	*205,754	147,822	60,326	87,496

JACKSONVILLE TRACTION COMPANY

1 m.,	Mar.,	'12	$51,257	$32,231	$19,026	$9,591	$9,437
1 "	"	'11	51,901	31,778	20,123	7,049	13,074
12 "	"	'12	562,956	350,754	212,202	106,307	105.895
12 "	"	'11	584,592	356,416	228,176	79,116	149,059

NORTHERN OHIO TRACTION & LIGHT COMPANY

1 m.,	Apr.,	'12	$221,784	$128,168	$93,616	$43.821	$49,795
1 "	"	'11	200,015	114,762	85,253	44,329	40,924
4 "	"	'12	845,271	495,537	349,733	175.287	174,446
4 "	"	'11	748,886	437,384	311,502	177,445	134,057

PADUCAH TRACTION & LIGHT COMPANY

1 m.,	Mar.,	'12	$23,656	$17,370	$6,290	$7,140	$850
1 "	"	'11	20,541	12,591	7,949	6,553	1,397
12 "	"	'12	273,542	175,198	98,344	82,709	15,635
12 "	"	'11	252,868	154,468	98,400	74,087	24,313

PENSACOLA ELECTRIC COMPANY

1 m.,	Mar.,	'12	$22,309	$14,671	$7,638	$6,377	$1,261
1 "	"	'11	22,841	14,861	7,980	5.210	2,771
12 "	"	'12	286,771	180,092	106,679	65,520	41,249
12 "	"	'11	278,677	173,138	105,539	54,620	50,918

SAVANNAH ELECTRIC COMPANY

1 m.,	Mar.,	'12	$58,964	$42,965	$15,999	$15,993	$6
1 "	"	'11	53,062	37,702	15,361	15.350	10
12 "	"	'12	712,264	525,021	187,243	186.099	1,144
12 "	"	'11	646,587	464,249	182,338	181,239	1,099

TAMPA ELECTRIC COMPANY

1 m.,	Mar.,	'12	$62,057	$33,364	$28,693	$4.361	$24,333
1 "	"	'11	56,804	29,753	27,051	4,756	24,333
12 "	"	'12	706,428	384,422	322,006	58,706	263,301
12 "	"	'11	596,621	346,014	250,606	51,119	199,487

TWIN CITY RAPID TRANSIT COMPANY

1 m.,	Apr.,	'12	$631,462	$325,788	$325,787	$143.079	$162,595
1 "	"	'11	620,672	319,940	319,940	140,079	160,653
4 "	"	'12	2,543,073	1,380,848	1,380,848	569,317	592,908
4 "	"	'11	2,441,711	1,290,471	1,290,471	560,317	590,924

*Includes taxes.

Traffic and Transportation

Mr. Huntington's Reasons for Opposing Rate-Making Ordinance

Under date of May 26, 1912, Henry E. Huntington, president of the Los Angeles (Cal.) Railway Corporation, addressed a letter to the members of the City Council in regard to the pending rate-regulating ordinance. He stated the position of the company in regard to the ordinance in part as follows so as to make the situation clear to the voters from the company's standpoint before the ordinance went before them at the polls:

"It has been charged that the rate-regulating ordinance is needed by the city in order that the proper authorities may inspect the books of the companies. This is untrue. I wish to make it absolutely plain that the books of the Los Angeles Railway are open to the city officials now or at any time they may desire, but I do not think it for the benefit of the city or the railways that this inspection should be made for the purpose of reducing fares. Paul Shoup, vice-president of the Pacific Electric, has assumed the same attitude. Now, if the books of the companies are open to the city it must be accepted that the only value which the ordinance will have will be to empower the city to fix a rate of fare.

"It is admitted that neither the city nor the companies can raise the widespread 5-cent fare. Since this is true, the only rate-fixing possible under the circumstances would be a reduction. The proponents of the ordinance deny most emphatically that they desire to 'split a nickel,' but neither they nor any one else can say what the next administration may attempt to do.

"When I first came to this city the fare was a nickel, then as now, but those who rode got nothing in comparison with what they receive for the same nickel now. At the present time, with the transfer system, one may ride almost 20 miles in Los Angeles for 5 cents. The situation to-day in American street railroading speaks for itself. The present construction has been possible from a financial point of view only because our bankers believe that a standard of earning was assured by the franchises. With a 5-cent fare certain—for no one ever dreamed of a lower figure—it could be figured that with increase in population and a consequent increase in earnings, extended and more expensive investments could be made. This has resulted in building up a city of homes in place of one of flats and tenements, and has helped to make Los Angeles the greatest all-year resort in the world. Only so long as the man with the dollar is assured of his principal, and has a fair chance for a fair return on that principal, can we go ahead with our railway investments.

"When I secured the franchises on which these roads were built I believed, and think that every man in the city believed, that the fare to be charged was a fixed matter and was forever settled. The plan was carried out and the lines were built with no thought in my mind that any change in fares, either for or against the company, could be made. I still believe that the fare cannot be legally changed. The nickel is the only standard that has remained stationary throughout the growth of the system. Cheap fare means cheap service, and uncertainty is in itself harmful. By and by Los Angeles will need subways and elevated lines to take care of her constantly increasing population, but if you hold a club over capital in the way of a threat of fare reduction—where is that money to come from? Of each nickel received, more than 3 cents goes to labor in some form or another. A cut in the fare cannot affect the money that is paid out on fixed charges—interest on bonds and other debts, taxes, assessments. These charges must be met from the revenue in any event. Any threat to reduce rates will limit expansion and improvements in service and must unfavorably affect the employee, either by reducing the number of men employed or that otherwise might be employed, or in preventing the men from obtaining the proper remuneration for their labor.

"It is charged that this ordinance must be passed in order that the city of Los Angeles may force needed improvements in the service. This is far from the truth. The question of the adequacy of the service is in the hands of the Board of Public Utilities. The question of the type of street work we do is in the hands of the Board of Public Works. Under the franchises and the ordinances in force the fact that improvement is necessary is all that must be shown before we are under obligation to carry out the improvements. I will personally pay one-half of the expense of sending a committee of city representatives through the East on an inspection tour, in order to verify the statements made in regard to Los Angeles' railway service. I am convinced that it is to the interest of every one concerned that the rate-regulation ordinance be defeated."

Demerit System in Illinois Traction Line Department

A system of demerits was inaugurated in the overhead line maintenance department of the Illinois Traction System on May 15, 1912. John Leisenring, signal engineer, in charge of this department, announces in the bulletin which states the purpose of the system and gives the method of applying demerits that prizes will be given to the foreman who has the fewest demerits on Oct. 31, 1912. The prize will take the form of a bonus of $20, and the lineman and groundman who make up the rest of the division force will receive $5 each.

It is the purpose of the system to keep the maintenance of overhead lines down to an operating base which will provide only one foreman, a lineman and a groundman for each of the five divisions of the traction system. This force will, however, be increased in an emergency. A temporary list of demerits has been worked out and will be added to from time to time. The total number of demerits will be given at the end of October, except for those which appertain to the use of line cars, faulty monthly reports and time slips, after an inspection of the system made by the general superintendent, the superintendent of overhead lines and the general line foremen at the end of October. The following is a list of the demerits as compiled at this time:

One demerit will be given for trolley out of line.
One for each loose back guy.
One for slack strain guys.
Five for each defective high-tension insulator.
Two for any material left along right-of-way, including poles.
Three for any pole standing in line that should be renewed.
Ten for untidy and disorderly condition of line car.
Ten for untidy and disorderly condition of storeroom.
Five for poorly maintained speeder.

One demerit mark will be given each month between now and the end of October for any difficulty experienced with time slips or monthly reports.

One for feeder insulator which is off.
One for messenger insulator which is off.
One for each hanger which is off.
Two for slack trolley.
Two for each feeder tap which is off.
One for feeder tap not in place.
Two for each day line cars are used.

The division foreman's attention will from time to time be called to various troubles along the line, so that he may repair the damage promptly. The men are urged to interest themselves in the question of line maintenance, not so much with a view to receiving the bonus as from pride in the upkeep of their division.

Accident Warning on Drinking Cups

Sanitary drinking cups which contain warnings to passengers about accidents have been installed by W. H. Boyce, superintendent of the lines of the Beaver Valley Traction Company, New Brighton, Pa. On the front of the cup appears the railroad warning "Stop—Look—Listen" in large type. Underneath this the following text is displayed in types of different measures, but not as large as "Stop—Look—Listen"

"After alighting from and passing behind a car, look for oncoming automobiles or cars from opposite direction.

"Never step on or off a car while in motion.

"Never face to rear in stepping off a car."

On the back of the cup there is the following warning:

"Don't allow children to play in streets on which electric cars run. Tell them to keep their eyes open and listen while crossing the tracks.

"Don't allow children to steal rides on the rear of a wagon or carriage. Their discovery by the driver often startles them into running in front of a moving car. The motorman may not see them in time to prevent an accident. Tell them it is extremely dangerous."

At each side on the front of the cup and at each side of the back of the cup, reading up and down on both sides, is this appeal to patrons to heed the warning as given: "Do This and Avoid Accident."

Commuters Entitled to Refund

The Public Service Commission of the Second District of New York has ruled that all persons who purchased commutation tickets for travel to and from Rochester via Charlotte on the lines east to Oswego and west to Niagara Falls are entitled to a refund, to be made by the New York Central & Hudson River Railroad, of the difference between the price paid therefor and the lower price established for such tickets in effect previous to Dec. 1, 1911, and re-established on March 1, 1912.

In June, 1908, the New York Central & Hudson River Railroad obtained permission of the commission to abandon passenger train operation on that part of the Rome, Watertown & Ogdensburg branch from Windsor Beach to Rochester and also to discontinue the State Street, Rochester, passenger station. Prior to such time passenger trains on the lines leading from Oswego and Niagara Falls were operated via Windsor Beach to the State Street station; thereafter such operation has been via Charlotte, passing through Center Park and into the Central Avenue station, and over this latter route the distance from various points on the two lines to Rochester is greater by approximately 2 miles than via the old route or Windsor Beach. When permission was obtained for abandonment of the old line the company stipulated that the passenger fares to Center Park and Central Avenue stations would not be increased because of the greater mileage via Charlotte. Through inadvertence, in December, 1911, the company put in effect a passenger tariff under authority of which the price for commutation tickets was based on the actual mileage via Charlotte instead of Windsor Beach. This was corrected in the tariff made effective on March 1 last, and the company has notified the commission of its willingness to make proper refund to any person or persons who may have purchased these commutation tickets during the period the higher charges were in force.

In addition to authorizing the refund of 75 cents to the complainant involved in the case the commission has directed the company to notify each person who is or has been, as shown by the company's records, the possessor of monthly tickets which were purchased at the higher charge of its willingness to make such refund.

Folder About Dellwood Park.—The Chicago & Joliet Electric Railway, Joliet, Ill., has published a very handsome folder which contains a description and photographs of Dellwood Park and calls attention to its proximity to Chicago and the special attractions provided at the park for summer outings.

Complaint Filed About Service in Phoenix.—Complaint has been filed with the Corporation Commission of Arizona about the service furnished by the Phoenix (Ariz.) Street Railway. The officers of the company have been ordered to show cause why the company should not be directed to remedy conditions about which complaint has been made.

Additional Accommodations for Louisville Railway Employees.—The Louisville (Ky.) Railway has provided for the installation in its new carhouse at Twenty-ninth Street and Broadway, Louisville, of shower baths sufficient to accommodate the 150 men who will use that carhouse as their headquarters. This is the only carhouse of the company which has bathing facilities.

Freight Service Proposed Between Boston and Worcester.—The Boston & Worcester Street Railway, Boston, Mass., plans to establish a freight service on its line. The final grant to engage in this class of business has been given to the company by the Railroad Commission. The company will have freight stations at Framingham, South Framingham, Natick and other points. As noted in the Electric Railway Journal of April 13, 1912, the company has ordered six cars to be used in this service.

Rules for Passengers Modified in Springfield.—The Springfield (Mass.) Street Railway has modified slightly the rules for passengers to which reference was made in the Electric Railway Journal of May 18, 1912, page 854, by arranging to place on sale permits or tickets entitling dogs to ride on the cars. The fare for each dog is fixed at 5 cents, and while no line of demarcation has been drawn to differentiate the several species, well-defined rules are set down to govern the conduct of the dog on the car and the behavior of the custodian of the dog.

Honesty Worth More Than Car Fare.—Wide publicity was given in the daily papers of June 3, 1912, to the sermon preached on the evening of the previous day by the pastor of the Euclid Avenue Baptist Church, Cleveland, Ohio, in which ten "don'ts" were prescribed for wives. The ninth "don't" as pronounced by the clergyman follows: "Don't forget to tell the truth, especially to the conductor about the age of your child. Honesty is worth more to you and him than a nickel. A boy who is eight years old at home and six on the cars will soon learn other things that are not so."

Re-routing Suggested in Springfield, Ill.—Business men around the Public Square in Springfield, Ill., have suggested that the Springfield Consolidated Railway reroute its cars and loop them around the Public Square. The present transfer point is at Fifth and Monroe Streets and is touched by all except one line. The business men claim that traffic is congested unnecessarily at the present transfer point. It is stated that A. A. Anderson, general manager of the company, does not believe the proposed plan practicable. The general opinion seems to be that the proposed plan would demand more transferring by the public.

Experimental Center-Entrance Car in Service in Brooklyn.—Representatives of the newspapers of New York and Brooklyn and a number of other persons were the guests of the Brooklyn (N. Y.) Rapid Transit Company on the initial trip of its experimental all-steel center-entrance car on June 7, 1912. The car will be placed in regular operation on the Gates Avenue line for local service in Brooklyn and will be looped at the Borough Hall in Brooklyn instead of being operated into New York at Park Row over the Brooklyn Bridge, as are most of the cars of this line. The plans for the construction of the car were described in the Electric Railway Journal of March 30, 1912, page 502.

Celebration of Organization of New Albany Companies.—Employees of the Louisville & Northern Railway & Light Company and the Louisville & Southern Indiana Traction Company, New Albany, Ind., were the guests of the management at an outing at Glenwood Park near that city on June 1, 1912, to celebrate the tenth anniversary of the organization of the present companies which control the public utilities of New Albany. There was no formal program of addresses. The afternoon and evening were devoted to athletic sports and to dancing. Several hundred employees of the company, and a number of invited guests attended. Glenwood Park is owned by the company and has been made very profitable by careful management and persistent advertising.

Illinois Traction System Purchases Terminal Site in Peoria.—The Illinois Traction System has acquired property at Peoria, Ill., to be used for a terminal station and office building for both the interurban and the local lines. Part of the proposed terminal site was formerly occupied by the National Hotel. The property fronts 243 ft. on Hamilton Street and 144 ft. on South Jefferson Street. The purchase price was $68,800. The company will prepare plans and specifications for the new terminal and office building at once and will probably begin construction this year. At present the office of the local railway and the general offices of the Illinois Traction Company, which operates the Peoria Railway, controlling the local lines in Peoria, are located in different sections of the city.

New Twin City Folder.—The Twin City Rapid Transit Company, Minneapolis, Minn., always noted for the tastefulness of its publications, has surpassed all former records in its 1912 traffic circular. The company is justified in its effort to promote pleasure and tourist riding, because the many lakes that surround Minneapolis make the territory which is reached by the lines of the company appeal to the lover of attractive scenery and to the pleasure seeker. The pamphlet contains thirty-two double pages with many views of historic and other points of interest in and about the Twin Cities, and maps of the railway system and of parts of it. The text describes the most direct route by which the tourist may reach each of the places described from St. Paul or from Minneapolis. The pamphlet was issued under the direction of A. W. Warnock, general passenger agent of the Twin City Rapid Transit Company, who is to be congratulated on the harmonious and attractive results which have been attained.

Recommendations Following Accident in Connecticut.—The following recommendations have been made by C. C. Elwell, chief engineer of the Public Utilities Commission of Connecticut, as a result of the investigation which he conducted into the causes of the recent derailment of a car of the Shore Line Electric Railway on May 3, 1912, near Guilford: "(1) That the company require its motormen to use greater care in running where tracks are not in good line and surface, especially around curves. (2) That a substantial guard made of T-rail be installed on the inner rail for the entire length of Long Hill curve. (3) That the soft material under the track at the foot of Long Hill grade be replaced with good ballast and the roadbed properly drained. (4) That frequent track inspection be made by a competent roadmaster, who should pay particular attention to the condition of curves and the line and surface of tracks. (5) That warnings, supplemented by caution signals, be given to the operatives where speed reductions are necessary to insure safe operation."

New Fare Arrangements of the Hudson & Manhattan Railroad.—The Hudson & Manhattan Railroad, operating between New York and New Jersey, placed on sale on June 1, 1912, in all its tunnel stations on the Sixth Avenue division in New York tickets good on the Newark rapid transit line, operated jointly by the Hudson & Manhattan Railroad and the Pennsylvania Railroad. Thus, passengers who desire to go to Park Place, Newark, or other points on the rapid transit line may go direct by the payment of a fare of 19 cents for one way, or 34 cents for the round trip, from any station of the Hudson & Manhattan Railroad in Sixth Avenue, New York. The rate to Newark from the Hudson tunnel stations on the Jersey side of the Hudson River will be 17 cents one way and 30 cents for the round trip, and the same rate will apply to the Hudson Terminal in downtown New York. It has also been arranged that holders of Pennsylvania Railroad tickets may cross to New Jersey via the Hudson & Manhattan Railroad by the payment of a supplemental fare of 2 cents, instead of 7 cents as charged previously.

Line Completed to Famous Mission Ridge.—The Chattanooga Railway & Light Company, Chattanooga, Tenn., has completed the line to Mission Ridge which has been under construction for several months. The ridge is one of the show points about Chattanooga, and the company has heretofore operated a separate line to its summit. Cars up the ridge will now be run from the center of the city instead of from the end of the urban line as before. The cars intended for this service were built at the shops of the company. They contain twenty plush-covered revolving chairs and electric fans and the floors are carpeted. The exterior is finished in maroon, yellow and gold, while the interior finish is of bird's-eye maple. The cars are of the pay-as-you-enter type. W. E. Boileau, general manager of the company, and a party of friends, including business men and representatives of the daily papers, inspected the line recently. The company plans to construct a line from Mission Ridge to Lookout Mountain. These two points are not now connected, but a new line similar to that up Mission Ridge is being built from Chattanooga to Lookout Mountain. When Mission Ridge and Lookout Mountain are connected the Chattanooga Railway & Light Company will have a scenic route 20 miles long.

Personal Mention

Mr. S. D. Egan, Toronto, Ont., has been appointed superintendent of the Regina Municipal Street Railway, Regina, Sask.

Mr. W. C. DeVane has resigned as superintendent of equipment of the Savannah (Ga.) Electric Company to enter business for himself.

Mr. C. O. Vandervanter, formerly chief engineer of the United Railways & Electric Company, Baltimore, Md., has been appointed assistant city engineer of Baltimore, Md.

Mr. A. B. Leighton, formerly superintendent of the Dover, Somersworth & Rochester Street Railway, Haverhill, Mass., has become associated with the Malden (Mass.) Electric Light Company.

Mr. H. C. Hazzard, the service expert of the electrical department of the State Railroad Commission of California, has been appointed, also, assistant attorney to Attorney Max Thelen of the commission.

Mr. H. C. Foss, until recently manager of the Cape Breton Electric Company, Ltd., Sydney, N. S., has been appointed general superintendent of the Savannah (Ga.) Electric Company to succeed Mr. E. T. Steel, resigned.

Mr. John T. Huntington has resigned as general manager of the Wisconsin Public Service Company, Green Bay, Wis., which is a consolidation of the Green Bay Traction Company and the Northern Hydroelectric Power Company.

Mr. J. J. Duck has resigned as auditor of the Chicago (Ill.) City Railway, to accept the position of auditor of the Philadelphia (Pa.) Rapid Transit Company. Mr. Duck was appointed auditor of the Chicago City Railway in December, 1907.

Mr. F. H. Atherton, of the office of the paymaster of the Delaware & Hudson Company at Scranton, Pa., has been appointed treasurer of the United Traction Company, Albany, N. Y., the Hudson Valley Railway, the Troy & New England Railway and the Cohoes Railway, to succeed Mr. James McCredie, resigned.

Mr. Edwin C. Clapp has been appointed superintendent, purchasing agent and park manager of the Bristol & Norfolk Street Railway, Boston, Mass., to succeed Mr. F. J. Williams, resigned. Mr. Clapp has been connected with the Bristol & Norfolk Street Railway for the last ten years. He entered the service of the company as a motorman.

Mr. William McClellan, electrical engineer of the Public Service Commission of the Second District of New York, was elected a manager of the American Institute of Electrical Engineers on May 21, 1912, for a term of three years. Mr. McClellan was also recently appointed chairman of the electrification committee of the New York Railroad Club.

Mr. I. C. Shellenberger has been appointed assistant auditor of the Chicago (Ill.) City Railway to succeed Mr. A. L. Dewey, who has been appointed auditor of the same company. Mr. Shellenberger entered the service of the Chicago City Railway in March, 1909, as a clerk. He had served previously as a clerk in the accounting department of the Michigan Central Railroad.

Mr. F. C. Evans has been appointed purchasing agent of the Chicago (Ill.) City Railway to succeed Mr. J. R. Davies, whose resignation was noted in the ELECTRIC RAILWAY JOURNAL of March 16, 1912. Mr. Evans was born in 1887. He entered the service of the Chicago City Railway as a stenographer in 1907. He was subsequently promoted to the position of assistant purchasing agent.

Mr. A. L. Dewey has been appointed auditor of the Chicago (Ill.) City Railway to succeed Mr. J. J. Duck, resigned. Mr. Dewey was born in September, 1878, at Valparaiso, Ind. He was graduated from high school and business college and began work as a stenographer with the Chicago City Railway on May 1, 1902. He was made chief clerk to the auditor in 1906 and assistant auditor in January, 1910.

Mr. F. G. Pullen, formerly with the General Electric Company at St. Louis, Mo., is to be sales manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., to succeed Mr. Frank C. Barrington, whose appointment to the Westinghouse Electric & Manufacturing Com-

pany is noted elsewhere in this column. Mr. Pullen was formerly connected with the Evansville Electric Light & Power Company, Evansville, Ind.

Mr. William L. Derr, who has been inspector of the transportation division of the Public Service Commission of the Second District of New York since June 8, 1909, has resigned to become superintendent of the divisions of the Chicago Great Western Railroad which run from Omaha, Neb., to Oelwin, Ia. Mr. Derr was formerly general superintendent of the New York (N. Y.) City Railway. He was educated at the Polytechnic College of Pennsylvania, Philadelphia, Pa., and entered railway service in 1876.

Mr. E. D. Dreyfus, for the last four years associated with the Westinghouse Machine Company, Pittsburgh, Pa., and formerly with the Allis-Chalmers Company, Commonwealth Edison Company and Buffalo Forge Company, has taken up special work with the West Penn Traction & Water Power Company, whose operations and activities have become greatly enlarged through recent consolidations. In the past Mr. Dreyfus has contributed a number of papers to engineering societies, particularly in connection with power generation.

Mr. W. B. Tarkington, formerly general superintendent of the Chicago & Southern Traction Company, Chicago, Ill., has been appointed superintendent of the Rock Island Southern Railway, Rock Island, Ill., of which Mr. W. W. McCullough is general manager. The position of general superintendent is a new one with the Rock Island Southern Railway. Mr. Tarkington began his career in the mechanical department of the Chicago & Northwestern Railroad and was later made division master mechanic on the Iowa division of that road. He was also connected with the Omaha & Council Bluffs Street Railway, Omaha, Neb., as general superintendent and with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., as superintendent of transportation.

Mr. Frank C. Barrington has resigned as sales manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., to become connected with the Westinghouse Electric & Manufacturing Company at Bloomfield, N. J. Mr. Barrington began his career in the electric field in 1892, with the People's Street Railway, St. Joseph, Mo. In 1893 he and Mr. George C. Rough, now sales manager of the Packard Electric Company, Toronto, Ont., and Mr. C. E. Roehl, electrical engineer of the Brooklyn (N. Y.) Rapid Transit Company, organized the Columbian Electric Company at St. Joseph, and Mr. Barrington was president and manager of the company until a few years ago, when he disposed of his interest and re-entered the service of the St. Joseph Railway, Light, Heat & Power Company.

Mr. Elmer M. White, for the past four years auditor of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., resigned on June 1, 1912, to accept the office of auditor of the Americana Company, publishers of the Encyclopedia Americana. Previous to his connection with the Coney Island & Brooklyn Railroad, Mr. White was for four years connected with the Birmingham Railway, Light & Power Company, Birmingham, Ala., first as assistant secretary and treasurer and later as auditor, and before going to Birmingham had been associated with the accounting department of the Hartford (Conn.) Street Railway for twenty years. Mr. White was secretary of the Street Railway Accountants' Association of America, later the American Street & Interurban Railway Accountants' Association, from 1904 until 1908.

OBITUARY

John W. Curley, superintendent of transportation of the Houston (Tex.) Electric Company, is dead. Mr. Curley had been confined to his bed since January. Mr. Curley began his street railway career in Boston about twenty-three years ago with the surface lines. Later he was connected with the Boston & Northern Street Railway as carhouse foreman, inspector and assistant superintendent. He entered the service of the Houston Electric Company about six years ago. For about three years he occupied the position of inspector and on Jan. 1, 1909, he was appointed superintendent of transportation to succeed Mr. Uriah Foss, who was transferred to the Boston office of Stone & Webster.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Little Rock & Argenta Railway, Little Rock, Ark.**—Incorporated in Arkansas to build a 7-mile electric railway from a point near the Rock Island depot in Little Rock to Argenta. Capital stock, $100,000. Directors: A. C. Read, M. W. Fleming, W. D. Cammack, — Ledwidge and S. L. White.

***Giesboro Railway, Washington, D. C.**—Application for a charter has been made in Washington, D. C., by this company to build an electric railway from Anacostia to the steel plant at Giesboro Point. This company is to have power to make contracts with the Anacostia & Potomac River Railroad, a part of the system of the Washington Railway & Electric Company, to enable the companies to run cars of each company over the tracks of the other and to buy power. Incorporators: Chales V. Wheeler, Corcoran Thom, Alec G. McKenna and Harry F. Clark, of the District of Columbia, and James W. Kinnear, James E. Porter and Eben B. Clarke, of Pennsylvania.

Atlanta & Macon Railway, Atlanta, Ga.—Chartered in Georgia to build an electric railway between Atlanta and Macon, Forest, Jonesboro, Lovejoy, Hampton, Sunnyside, Griffin and Forsyth. Capital stock, $100,000. Incorporators: W. D. Seahan, Kennatt Cowan, S. Bullard, C. G. Young, R. S. Parker, H. M. Scott, W. J. Massee, H. R. Stewart, S. Grantland, W. J. Kincaid and James M. Brannen. [E. R. J., April 27, '12.]

***Montpelier (Ind.) Traction Company.**—Application for a charter has been made by this company in Indiana to build an electric railway from Marion to Montpelier. Capital stock, $15,000. Incorporators: C. L. Smith, A. H. Bonham, N. W. Lacey, D. E. Binns and A. E. Townsend.

***Jackson Light & Traction Company, Jackson, Miss.**—Incorporated in Mississippi as successor to the Jackson Railway & Light Company. Capital stock, $1,600,000. Incorporators: Paul A. Heuffer, Harry H. Philips and Charles J. Horn.

Newbern-Ghent Street Railway, Newbern, N. C.—Chartered in North Carolina to build an electric railway between Newbern and Ghent. Capital stock, $25,000. Incorporators: Brit Sellerding, J. W. Brown, Jr., E. C. Armstrong, C. J. Carthey and others. [E. R. J., Feb. 24, '12.]

Columbus Depot Company, Columbus, Ohio.—Incorporated in Ohio on May 29, 1912, by men interested in the Scioto Valley Traction Company to build a terminal station in Columbus. The preliminary capital stock of the company is $250,000. Officers: W. F. Burdell, president; L. D. Hagerty, vice-president, and E. R. Sharp, Jr., secretary and treasurer.

***Portland, Nehalem & Seacoast Railway, Portland, Ore.**—Application for a charter has been made by this company to build an interurban railway from Portland to Astoria. Capital stock, $750,000. Incorporators: J. A. Jackson, C. E. Wightman and W. O. McCarthy.

***South Fork Railway, Altoona, Pa.**—Application for a charter has been made in Pennsylvania by this company to build an electric railway from Altoona to Johnstown. It is planned to build first from South Fork to Portage, then from Portage to Cresson, and next from Cresson to Altoona. Charles H. Morgan, Altoona, is interested.

FRANCHISES

Los Angeles, Cal.—Anson W. Delane, 404 Higgins Building, Los Angeles, Cal., has applied to the Council for a franchise for the construction of a system of elevated railways there, with lines to Vendee and Ocean Park. The application has been referred by the Council to the Board of Public Utilities for investigation and report.

Los Angeles, Cal.—The Los Angeles Railway has asked the Council for a franchise for its Eagle Rock Valley line in Los Angeles.

Monterey, Cal.—The Monterey & Pacific Grove Railway will ask the Council for a franchise to rehabilitate its line in Monterey. The entire line between Monterey and Pacific Grove will be rebuilt.

Sacramento, Cal.—The Vallejo & Northern Railway, Vallejo, has received a franchise from the Council for a line on Front Street to the Sacramento River to connect with the new bridge in Sacramento.

Santa Barbara, Cal.—George I. Cochran and George A. Batchelder, Los Angeles, have received a forty-five-year franchise from the Council to build an electric railway in Santa Barbara. [E. R. J., May 25, '12.]

Macon, Ga.—The Georgia Public Service Corporation, Macon, has received a franchise from the Council in Macon. W. J. Massee and J. T. Nynan, Macon, are interested. [E. R. J., May 25, '12.]

Chicago, Ill.—The Chicago & Suburban Traction Company has asked the County Board for a franchise to construct 91 miles of new track in the county outside of Chicago. Three lines are proposed, one from Evanston to Elgin, another from Elgin to Oak Forest infirmary, and the other from the infirmary to the Indiana State line near Hammond. W. J. C. Kenyon, president. [E. R. J., Sept. 2, '12.]

Terre Haute, Ind.—I. A. Smith, St. Louis, Mo., president of the Springfield & Central Illinois Traction Company, has petitioned the Commissioners of Vigo County for use of the Wabash Avenue bridge over the Wabash River. This line will connect Springfield, Pawnee, Hillsboro, Durley, Carlyle, Hoffman and Centralia. [E. R. J., Jan. 6, '12.]

Dubuque, Ia.—The Union Electric Company, Dubuque, has received a franchise from the Council to build a new line in Dubuque to connect with its present lines and to extend its tracks into Eagle Point Park.

Waterloo, Ia.—The Waterloo, Cedar Falls & Northern Railway has asked the Council for a franchise to change the route and extend some of its lines in Waterloo.

Shreveport, La.—The Shreveport Traction Company has asked the Council for a franchise to build two extensions, one through the City Park and the other through Ingersoll Heights.

Wakefield, Mass.—The Bay State Street Railway, Boston, will ask the Council for a franchise in Wakefield. The company plans to build a through line from Wakefield to Sullivan Square via Stoneham.

Croswell, Mich.—The Port Huron & Northern Railway, Detroit, has received a franchise in Croswell. This 50-mile electric railway will connect Lake Huron and Sandusky, via Lakeport, Lexington and Croswell. Julius I. Sumner, 502 Wayne County Bank Building, Detroit, president. [E. R. J., May 4, '12.]

Grosse Point, Mich.—The Thumb District Improvement Company has received a twenty-five-year franchise from the Town Board in Grosse Pointe. This line will connect Detroit, Bad Axe, Grosse Pointe, Mount Clemens and Armada. [E. R. J., April 13, '12.]

Freeport, N. Y.—The Freeport Railroad has received a franchise from the Council in Freeport for an electric line which will divide the village east and west from its center to the waterfront at Woodcleft.

Rochester, N. Y.—The Public Service Commission, Second District, has granted permission to the New York State Railways to construct an extension of its double-track line on Clinton Avenue south in Rochester, between the old city line and the present southerly city line.

Hamilton, Ont.—The Lake Erie & Northern Electric Railway, Brantford, has received approval of the Dominion Railway Commissioners for highway crossings between Brantford and Port Dover. Its application to cross at grade the tracks of the Brantford & Hamilton Electric Railway, the Toronto, Hamilton & Buffalo Railway and the Grand Valley Railway in Brantford was approved. Announcement was made on May 25 that the Lake Erie & Northern Railway project, with a line to Port Dover, and another line to Galt, was now assured, provided by-laws carry in the various municipalities for debenture stock.

Stratford, Ont.—The Stratford Street Railway has received a franchise from the Council in Stratford. Work will be begun within a few days. J. C. Rothery, Toronto, is interested. [E. R. J., May 11, '12.]

Stayton, Ore.—J. F. Mounce has received a franchise from the Council to build an electric railway in Stayton.

Westerly, R. I.—The Norwich & Westerly Traction Company, Norwich, Conn., not the Connecticut Company as reported in the ELECTRIC RAILWAY JOURNAL for May 25, has asked the Council for a franchise for a line from Pleasant View to Weekapaug.

TRACK AND ROADWAY

Birmingham Railway, Light & Power Company, Birmingham, Ala.—Surveys are being made by this company for the extension of the Gate City line to Irondale, where it will run to the depots in Irondale and make a loop back to Gate City, a distance of 1 mile.

Mobile West Shore Traction Company, Mobile, Ala.—At a meeting of the stockholders of this company on May 29 a bond issue of $2,000,000 was authorized for the construction of its electric railway, which will extend along the western shore of Mobile Bay, touch the coast resorts of Mobile County and run along the Mississippi Sound as far as Pascagoula, Miss. The company will furnish power for lighting purposes. Capital stock authorized, $100,000; issued, $13,850. Bonds authorized, $2,000,000. Officers: Hurisco Austell, Bank of Mobile Building, Mobile, president; Robert K. Warren, 53 St. Michael Street, Mobile, vice-president and general manager, and Benjamin B. Cox, Bank of Mobile Building, Mobile, secretary and treasurer. [E. R. J., May 11, '12.]

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company has awarded a contract for the construction of a new 800-ft. steel viaduct to the Illinois Bridge Company.

Glendale & Verdugo Mountain Railway, Glendale, Cal.—This company advises that it will begin construction within the next few weeks on its 2-mile electric railway to connect Glendale and Los Angeles with the summit of Verdugo Mountain. This is the system of inclined railway invented and patented by Lewis Ginger, Glendale. The company will operate six cars. Capital stock, $50,000. Lewis T. Ginger, Glendale, president, and Brown Zerr Engineering Company, Glendale, chief engineer. [E. R. J., May 11, '12.]

Pacific Electric Railway, Los Angeles, Cal.—This company plans to extend its new Van Nuys branch from Van Nuys to Owensmouth.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—This company has awarded a contract for the construction of its Bay Point-Sacramento line to J. G. White & Company. Work is to be begun early in July.

San Diego, Riverside & Los Angeles Railway, San Diego, Cal.—Work has been begun by this company in San Diego on its line to connect San Diego and Los Angeles. G. W. Pursell, San Diego, chief engineer. [E. R. J., March 23, '12.]

San Jose (Cal.) Terminal Railway.—This company advises that it has graded 5 miles of its 10¾-mile electric railway between San Jose and Alviso. Capital stock authorized, $2,500,000; issued, $1,532,800. Bonds authorized, $1,000,000; issued, $50,000. Officers: Hugh Center, president; John A. Mehling, vice-president and general manager; M. J. Gardner, secretary; the Bank of San Jose, treasurer; W. E. Greiver, chief engineer. Headquarters: 425 Bank of San Jose Building, San Jose. [E. R. J., May 25, '12.]

Sacramento Valley West Side Electric Railway, Willows, Cal.—This company is obtaining right-of-way and will begin soon the construction of its 160-mile railway to connect Red Bluff, Tehama, Corning, Orland, Germantown, Willows, Maxwell, Williams, Arbuckle, Durrigan, Yalo, Woodland, Dixon, Sacramento and San Francisco. It will operate 120 cars. Officers: Charles L. Donohue, Willows, president; H. W. Manor, Williams, vice-president; E. L. Lisson, Red Bluff, secretary; J. Reith, Jr., Woodland, treasurer, and Melville Dozier, Jr., Sacramento, chief engineer. [E. R. J., May 18, '12.]

***Ruskin & Morris Park Interurban Railway, Ruskin, Fla.**—This company will soon apply for a charter to build an electric railway between Ruskin and Morris Park.

St. Petersburg Railway & Light Company, St. Petersburg, Fla.—Work will soon be begun by this company on its extension on Central Avenue in St. Petersburg out toward Boca Ceiga Bay.

Tampa & Sulphur Springs Traction Company, Tampa, Fla.—Rails are being laid on Tampa Street from Ross Avenue to Seventh Avenue, Tampa, connecting the lines of the Tampa & Sulphur Springs Traction Company with those of the Tampa Electric Company.

Columbus, Chattahoochee Valley & Gulf Railway, Columbus, Ga.—This company, which plans to build an interurban railway between Georgetown and Atlanta, has completed its organization by the election of the following officers: Johnson Williams, president; L. F. Humber, vice-president; S. M. Quincey, secretary and treasurer, and Josiah Flournoy, chief engineer and general manager. [E. R. J., May 11, '12.]

Cambridge, Indian Valley & Eastern Railroad, Cambridge, Idaho.—This company advises that this 15-mile line from Cambridge through the Indian Valley will be a steam railroad. [E. R. J., May 18, '12.]

Illinois Central Electric Railway, Canton, Ill.—Most of the right-of-way has been secured and construction will soon be begun by this company on the extension from St. David to Lewiston.

Rochelle, Oregon & De Kalb Electric Railway, Chicago, Ill.—This company advises that construction will be begun within the next two months on its 75-mile electric railway to connect Rochelle, Rockford, Oregon, Ottawa and Amboy. Its power station will be located at Rochelle. Robert J. Scott, 705 Isabella Building, Chicago, president; Earl H. Burton, secretary, and J. J. Burns, general manager, all of 705 Isabella Building, Chicago. [E. R. J., May 11, '12.]

East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill.—This company, which has constructed a line from Dupo to East St. Louis and which has tracks laid from Columbia and Waterloo, Ill., to East St. Louis, ran its first car over Eads Bridge on May 24. At present the new system will operate only between Dupo and East St. Louis, a distance of about 11 miles, but work is being pushed to complete the remainder of the line in a few weeks.

***Evansville, Ind.**—Plans are being made by A. C. Stone and others to build a line from Evansville to Indianapolis. The proposed route has already been surveyed and the promoters are securing additional rights-of-way. Two rivers are to be bridged

Evansville, Chrisney & Eastern Railway, Evansville, Ind.—Surveys have been made by this company between Boonville tnd Lynnville and from Boonville to Chrisney, and arrangements are being made to award contracts to build the section from Booneville to Chrisney via Evansville. J. P. Christney, president. [E. R. J., April 20, '12.]

Union Electric Company, Dubuque, Ia.—This company plans to build an extension out West Locust Street. The company has received a twenty-five-year franchise from the Council for a line from Rhomberg Avenue via Seventh Avenue into Eagle Point Park in Dubuque.

Kentucky Central Electric Railway, Frankfort, Ky.—W. A. Calhoun, Buffalo, N. Y., is completing a commercial report on the route proposed for this company, which plans to construct a line from Glasgow to Hodgenville. [E. R. J., May 11, '12.]

Kentucky Southwestern Railway, Light & Power Company, Hickman, Ky.—Most of the right-of-way has been secured by this company in western Kentucky and it is expected that construction will soon be begun on its electric railway to connect Hickman and Paducah. H. C. Rodes is interested. [E. R. J., March 9, '12.]

Kentucky Traction & Terminal Company, Lexington, Ky.—This company is considering the extension of its line from Frankfort to Shelbyville. Surveys have been made during the past few weeks. This company operates a line from Lexington to Frankfort, and the Louisville & Interurban Railway operates from Louisville to Shelbyville, so that if the extension is built it will give direct connection between Louisville and Lexington.

***Madison, Hanover and Scottsburg Railway, Louisville, Ky.**—Surveys are being made by this company for an electric railway from Madison, Ind., to Scottsburg. It will connect at Scottsburg with the Indianapolis & Louisville Traction Company. Henry Porkney, Frederick Hoffstadt and Clarence R. Martin, Indianapolis, are interested.

Shelbyville, Ky.—In regard to the electric line to be built from Shelbyville to Frankfort, Ky., it is stated that W. J. Lindsay, Cleveland, is the representative of a syndicate which will finance the project. Rowland Cox, with headquarters at Taylorsville, is chief engineer and is in charge of the survey which is now being made. It has not been stated whether or not the Kentucky Traction & Terminal Company, which it was said was to build the extension, is to be interested in the line. [E. R. J., Sept. 23, '12.]

Southwestern Traction & Power Company, New Orleans, La.—This company has placed in operation its line between New Iberia and Jeanerette.

Aroostook Valley Railroad, Presque Isle, Maine.—It is reported that work on this company's extension from New Sweden through Stockholm to Madawaska Lake, a distance of 12 miles, will be begun this summer, and that the lake will be developed as a summer resort.

Mexico (Mex.) Tramways.—Work has been begun by this company on its two extensions, one to Puebla, about 125 miles, and the other to Toluca, about 45 miles. The Toluca line will be placed in operation between Mexico City and Cuajimalpa, about 9 miles, by July 1.

Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo.—This company will begin at once to lay rails on its line to connect Kansas City, St. Joseph, Excelsior Springs, Liberty and Faucett. It has awarded the following contracts: Steel work, Central States Bridge Company, Indianapolis; special track work, Indianapolis Switch & Frog Company, Springfield, Ohio; track crossings, Elliott Switch & Frog Company of St. Louis.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission has approved the assignment of the contract of the Bradley Contracting Company for Section 13 of the Lexington Avenue subway, the price of which is $4,071,416, to the McMullen, Snare & Triest Company, Inc. The latter company already has the contract for Section 14, which takes in the tunnel under the Harlem River.

Syracuse, Watertown & St. Lawrence River Railroad, Syracuse, N. Y.—This company has been authorized by the Public Service Commission, Second District, to build its 6-mile electric railway to extend from stop No. 9 on the Syracuse & South Bay Electric Railroad to Brewerton. Work has been begun. Capital stock authorized, $100,000; bonds authorized, $200,000. Officers: H. C. Beatty, president; W. C. Gray, vice-president; H. D. Brewster, secretary; W. W. Foster, treasurer, and T. H. Mather, chief engineer, all of the O. C. S. Bank Building, Syracuse.

Cleveland (Ohio) Railway.—This company is relaying 2 miles of 95-lb. T-rail to replace the girder rail now in service, which varies from 85 lb. to 97 lb. per yard. As granite block is used for paving between and one foot outside the rails, the engineers expect better results from the T-rail than those received from the girder rail, with no increase in the paving maintenance.

Lehigh Valley Transit Company, Allentown, Pa.—Bids are being received by this company for the construction of the South Eighth Street bridge in Allentown, which will connect Allentown with the Philadelphia division of the system by means of an air line running to Sixty-ninth Street and Market Street, Philadelphia. The bridge will be 2650 ft. long.

***Morristown, Tenn.**—The Morristown Commercial Club, Morristown, has started a movement for the organization of a company with $1,500,000 capital stock, the chief purpose of which, it is stated, is to be the construction of an electric line to connect Morristown and several other points in eastern Tennessee. At the direction of the club a number of sites for water-power plants have been surveyed and formal organization of the company is to be undertaken in the near future.

***Woodbury, Tenn.**—James A. Jones, Woodbury, plans to build an electric railway from Woodbury to McMinnville. The line will be operated in connection with an interurban road from Nashville to Murfreesboro.

SHOPS AND BUILDINGS

Trenton-Mercer County Traction Company, Trenton, N. J.—Ground has been broken by this company for the erection of the new car storage house to be situated on ground adjoining the present carhouse in South Trenton. It will be of corrugated iron and will be built by the Scott & Dey Company. The company contemplates the building of another carhouse on the ground situated between the old carhouse and the one just erected. The plans call for accommodation for forty double-truck cars. This will be a steel structure with concrete inspection pits and other features, including a drop pit for changing car wheels. The structure will have rolling steel doors.

Columbus Depot Company, Columbus, Ohio.—This company plans to build its new terminal station between Rich Street, Front Street, Walnut Street and Town Street in Columbus. W. F. Burdell, president.

Panhandle Traction Company, Wheeling, W. Va.—Plans are being made to begin soon the construction of the company's new carhouse at North Warwood.

Wheeling (W. Va.) Traction Company.—Contracts will soon be awarded by this company to build its new carhouses and repair shops to adjoin the present structure on the island. The new structure will be 125 ft. x 153 ft., one story in part and two stories in part, of reinforced concrete. The cost is estimated to be $100,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Bids are being received by this company for the construction of a repair shop and wash shop on Thirty-fifth Street and Fond du Lac Avenue. The buildings will be 500 ft. long, one 60 ft. wide and the other 70 ft. wide. R. H. Pinkley is in charge of the construction department.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company has awarded the contract for the construction of a steam auxiliary plant on Saanich Inlet, which will involve the expenditure of over $400,000, to C. C. Moore & Company, Seattle. The equipment in addition to a complete steam generating plant will consist of two Allis-Chalmers turbo-generators, each having a capacity of 2,000 kw. The entire production will give the plant an output equivalent to 6,000 hp.

United Railways, St. Louis, Mo.—The main power house and carhouses of this company at Park and Vandeventer Avenues were damaged by fire on June 4. The company's washhouse and some cars and other equipment, valued at $65,000, were destroyed.

Cleveland (Ohio) Railway Company.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for nine 1500-kw, 60-cycle rotary converters and two 1000-kw, 60-cycle rotary converters of special design. An order was also placed with the same company for twenty-eight air-blast 550-kva single-phase transformers for 11,000-volt a.c. primary, seven 375-kva, 1500-cu. ft. induction motor-driven blowers and two 800-cu. ft. blowers of the same type. The new equipment was purchased in order to equip five new substations which this company is building as a result of its power contract with the Cleveland Electric Illuminating Company, noted in the ELECTRIC RAILWAY JOURNAL of April 20, page 664. The order for the switchboard equipment is not yet placed.

Southern Cambria Railway, Johnstown, Pa.—This company has ordered two 500-kw, 1200-volt d.c. generators from the General Electric Company. The company has also placed an order for one cross-compound Corliss engine with the Filer & Stowell Company.

West Penn Railways, Pittsburgh, Pa.—It is probable that definite plans will be announced shortly in connection with the construction of a large hydroelectric development near Pittsburgh by the American Water Works & Guarantee Company and interests allied with that company. A large part of the power generated by the hydroelectric company can be absorbed by the railway, light and power systems of the West Penn Traction Company, a majority of the stock of which is owned by the American Water Works & Guarantee Company. The West Penn Traction Company's main power house at Connellsville has a capacity of 42,000 hp.

Manufactures and Supplies

ROLLING STOCK

Valdosta (Ga.) Street Railway will be in the market this fall for three cars and equipment.

United Traction Company, Albany, N. Y., has ordered twenty single-truck closed cars from the Laconia Car Company.

Berkshire Street Railway, Pittsfield, Mass., has ordered five express car bodies from the Wason Manufacturing Company.

United Railways, St. Louis, Mo., lost eighteen cars and two snow sweepers in a fire which destroyed its washhouse on May 29.

Boston (Mass.) Elevated Railway has ordered twenty all-steel 70-ft. cars from the Laconia Car Company for use in the Cambridge subway.

Manchester Traction, Light & Power Company, Manchester, N. H., has ordered six double-truck closed cars from the Laconia Car Company.

Laurel Electric Light & Power Company, Laurel, Miss., has ordered four cars from the American Car Company, through A. M. Hewes & Company.

St. Albans & Swanton Traction Company, St. Albans, Vt., will probably purchase several open cars and two double-truck snow plows. The company has a number of fifteen-bench open cars and a plow previously in use for sale.

Houston (Tex.) Electric Company has ordered fifteen additional double-truck cars from the St. Louis Car Company, through Wendell & MacDuffie, New York, N. Y. The cars will be of Stone & Webster standard semi-steel construction.

TRADE NOTES

Pierson, Roeding & Company, San Francisco, Cal., have transferred T. H. Dooling from Portland to the San Francisco office of the company.

Bucyrus Company, South Milwaukee, Wis., has opened an office at 1250 Brown-Marx Building, Birmingham, Ala., under the management of E. L. Byron, who will have charge of sales in the Southern States.

Standard Roller Bearing Company, Philadelphia, Pa., has installed more than $100,000 worth of additional machinery equipment to increase its facilities in order to meet the increased demand for its product.

Perry Ventilator Corporation, New Bedford, Mass., has received an order for ventilators for the thirty-five new prepayment cars now being built by the St. Louis Car Company for the Boston Elevated Railway.

Wendell & MacDuffie Company, New York, N. Y., has arranged to act as general sales agent for the Providence fenders and wheel guards which are manufactured by the Consolidated Car Fender Company, Providence, R. I.

Electric Storage Battery Company, Philadelphia, Pa., has purchased a plot containing one-third of an acre adjoining its plant on Allegheny Avenue and Nineteenth Street. It is stated that the company plans to enlarge its factory.

Dearborn Drug & Chemical Works, Chicago, Ill., have removed their Indianapolis office to 919 Hume Mansur Building. J. F. McDonnell has succeeded Mr. Clark as manager of that office, Mr. Clark having resigned June 1, to take charge of the Acme Engineering Company.

McKeen Motor Car Company, Omaha, Neb., has shipped two 70-ft. motor cars via the Missouri Pacific Railroad to Weatherford, Tex. These cars are for the Weatherford, Mineral Wells & Northwestern Railway and will be operated between Weatherford and Mineral Wells, Tex.

W. J. Jeandron, New York, N. Y., agent for the Le Carbone brush, states that his company furnished the Third Avenue Railway, New York, 11,500 brushes between June 19, 1908, and May 7, 1912, instead of "since Oct. 10, 1911," as stated on page 933 of the issue of this paper for June 1, 1912.

Jacobs & Davies, Inc., New York, N. Y., have opened their Montreal office in the Eastern Townships Bank Building, 263 St. James Street, for the practice of general con-

sulting and construction engineering, which business will be under the management of Paul Seurot, their representative in Canada.

Eastern Car Company, Ottawa, Ont., has been organized by interests associated with the Nova Scotia Steel & Coal Company, to construct a plant at New Glasgow, N. S. The company will built steel underframe cars. The plant will have an initial capacity of twenty-five cars daily and will employ 800 to 1000 men.

The Goldborough Company, Denver, Col., has appointed Charles W. Comstock its engineering manager, with headquarters at the main office of the company, First National Bank Building, Denver, Col. Mr. Comstock has acted as consulting engineer to the city of Denver and has been state engineer of Colorado since 1909.

Duntley Pneumatic Tool Company, Chicago, Ill., has been incorporated by J. W. Duntley and associates, with a capital stock of $100,000. The company has contracted with the Gibbons & Lewis Company, Fond du Lac, Wis., to manufacture a full line of pneumatic tools, and the Duntley Manufacturing Company, Chicago, Ill., will act as the selling agency.

International Steam Pump Company, New York, N. Y., has elected Solomon R. Guggenheim and Thomas M. Shumacher directors to fill the vacancies caused by the deaths of Benjamin Guggenheim and Arnold Panzier. No action was taken by the board to fill the office of president of the company. The affairs of the company are now being managed by the first vice-president.

Watson-Stillman Company, New York, N. Y., has elected the following officers for the ensuing year: E. A. Stillman, president; A. F. Stillman, vice-president and secretary; J. P. Bird, treasurer; Carl Wigtel, chief engineer; Frank Lary, superintendent. A new branch office is to be opened at Philadelphia shortly and shop facilities are being improved to meet increasing business.

Alberger Pump & Condenser Company, New York, N. Y., announces that the corporations heretofore known as Alberger Condenser Company, Alberger Pump Company, Newburgh Ice Machine & Engine Company have been consolidated under one management in a new corporation under the laws of the State of New York, to be known as Alberger Pump & Condenser Company.

General Fire Extinguisher Company, Providence, R. I., reports several instances in which the Grinnell automatic sprinkler was the means for extinguishing fires. The fires occurred in the boiler rooms of the Cohoes Foundry & Machine Company and the Mattatuck Manufacturing Company. In each case only one automatic sprinkler head was opened by the heat, and the damage was trifling.

Western Electric Company, New York, N. Y., has appointed L. F. Philo its sales manager at Buffalo. The company has made additions to the sales and office forces and has taken steps to increase the stock at the Buffalo branch in order to facilitate the handling of the business of the customers in that territory. The company has received another order from the Baltimore & Ohio Railroad for selector equipment to be used in extending its facilities for dispatching trains by telephone. The division to be equipped lies west of Cincinnati, extending from that place to Montgomery, Ind., and branching off at Seymour, Ind., to go to Louisville, Ky., and Jeffersonville, Ind. The Western Electric Company has also received an order for additional telephone dispatching apparatus from the Lehigh Valley Railroad. The division to be equipped is the Elmira and Corning branch, extending over approximately 140 miles of road. The Pittsburgh & Lake Erie Railroad and the Central of Georgia Railroad have also ordered telephone dispatching equipment from the company.

ADVERTISING LITERATURE

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin No. 132 for May, 1912, of second-hand rails, locomotives, cars, car equipments and contractors' supplies.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has issued a twenty-four-page booklet in which several of its private telephone systems are described and illustrated.

California Corrugated Culvert Company, Los Angeles, Cal., has reprinted in booklet form an address entitled "Corrugated Metal Culverts," made by Chris. P. Jensen, city engineer of Fresno, before the convention of California municipalities at Santa Barbara, Oct. 23-28, 1911.

Pyrene Manufacturing Company, New York, N. Y., has issued a folder in which ten reasons are cited why the Pyrene fire extinguisher is superior to the three-gallon chemical extinguisher. The company has mailed to a large number of electric railway officials and central and power station officials a copy of the Providence *Evening Journal* with an insert showing the performance of Pyrene as a fire extinguisher.

Federal Storage Battery Car Company, Silver Lake, N. J., has issued in pamphlet form Bulletin 30. It gives extracts from a paper read at the Cooperstown convention of the Street Railway Association of the State of New York by Ralph H. Beach, together with a technical description of the Edison battery and various data relating to the performance of Beach storage battery cars. Among other figures are some which show the difference in power required with wheels fixed rigidly on the axles and with independent wheel rotation.

Prepayment Car Patent Suit in Pittsburgh

In this column last week a short note appeared in which the Prepayment Car Sales Company was quoted as to its reasons for temporarily discontinuing its suit against the Pittsburgh Railways for infringement of its patents on pay-within mechanism. This paper is in receipt of a letter dated June 4 from James D. Callery, president Pittsburgh Railways, as follows:

"Permit me to add some facts to the statement in your journal of June 1 made by the Prepayment Car Sales Company with reference to its suit against the Pittsburgh Railways Company entered in August, 1911, and on trial May, 1912. In justice to the Railways Company and for the proper information of others interested we would ask you to give this the same publicity as your former statement. We were alleged to have infringed patents No. 935,929 and No. 949,717. At the beginning of the trial the Prepayment Car Sales Company withdrew patent No. 949,717, leaving in question only patent No. 935,029. Its claim was that the only one of its patents which it believed was infringed in Pittsburgh was patent No. 935,929 and it offered evidence to prove that patent No. 935,929 was its basic patent.

"Testimony was taken for six days, and when all of the evidence of both sides had been presented to the court, attorneys for the Prepayment Car Sales Company asked for a voluntary non-suit, on the ground that all of the cars in operation were not included in the suit. This request was granted with the result that a decision on the validity of the so-called basic patent is delayed from six months to a year. The question at issue was not primarily the amount of damages. The number of cars or period of time was unimportant. The principal matter to be settled was the validity and scope of the Rowntree patent and whether or not the Pittsburgh cars infringed the patent in suit. The above would appear reasonable, in view of the fact that the Prepayment Car Sales Company would have ample redress at law for the recovery of damages after the vital question as to the scope and validity of the patent in suit and the extent of the alleged infringement of the Pittsburgh cars had been determined. This would have had the advantage of clearing up the situation without further delay."

Thomas W. Casey, general manager of the Prepayment Car Sales Company of New York, in relation to the points mentioned above, said: "It should be explained that one only of the numerous patents which this company controls was selected, during the course of the trial, upon which to base a claim, being the particular patent most closely infringed upon. We would also like to point out that this action was brought by us in August last and came up for trial in December, but at the instance of the defendant, the Pittsburgh Railways Company, was postponed until the month of May. We hope and anticipate that there will be no further opposition to bringing the action to a speedy hearing."